Agenda Book

EXCOM / SCICOM / OPCOM Joint Meeting

JOIDES Executive Committee (EXCOM)

15-16 February 2000

JOIDES Science Committee (SCICOM)

15-17 February 2000

JOIDES Operations Committee (OPCOM)

16-17 February 2000

Washington DC

Prepared by the JOIDES Offfice, GEOMAR Research Center, Wischhofstr. 1-3, 24148 Kiel, GERMANY

EXCOM Participant list

Members

Helmut Beiersdorf	Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Otis Brown	Rosenstiel School of Marine & Atmosph. Sci, University of Miami, FL
Menchu Comas	Instituto Andulaz de Ciencias de la Tierra, University of Granada, Spain
Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, OR
Robert Detrick	Woods Hole Oceanographic Institution, MA
Richard Hiscott	Memorial University of Newfoundland, St. John's, Canada
Dennis Kent	Rutgers University, New Brunswick, NJ
Roger Larson	University of Rhode Island, RI
John Mutter	Lamont-Doherty Earth Observatory, Palisades, NY
John Orcutt	Scripps Institution of Oceanography, University of California, CA
David Prior	College of Geosciences & Maritime Studies, Texas A&M University, TX
Barry Raleigh	University of Hawaii, HI
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, TX
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Countries Observers

Mathilde Cannat	Université Pierre et Marie Curie, Paris, France
Zhixiong Wang	Marine High Technology Bureau, China

Liaisons

Jeff Fox	Science Operator (ODP-TAMU), Texas A&M University, TX
David Goldberg	Wireline Logging Services (ODP-LDEO), Palisades, NY
Bill Hay	SCICOM Chair, JOIDES Office, GEOMAR, Kiel, Germany
Bruce Malfait	National Science Foundation, Washington DC
Kate Moran	Joint Oceanographic Institutions, Inc., Washington DC

Guests and Observers

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Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin-ichi Kuramoto	STA, Japan
Ted Moore	University of Michigan, Ann Arbor, MI, (Chair IPSC)
Arthur Nowell	School of Oceanography, University of Washington, WA
Neil Sullivan	University of Florida, Gainesville, FL
Philippe Vidal	CNRS, Paris, France
Shin-ichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	OD21 Program Office, Japan Marine Science and Technology Center
James Watkins	Joint Oceanographic Institutions, Inc., Washington DC
Robert Winokur	JOI-CORE, Washington DC

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Bettina Rohr	Administrative Assistant
Jeff Schuffert	US Liaison

SCICOM Participant List

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Gerard C. Bond	Lamont Doherty Earth Observatory, Palisades, NY
Sherman Bloomer	Oregon State University, Corvallis, OR
Mike Coffin	Institute for Geophysics, University of Texas at Austin, TX
Patricia Fryer	University of Hawaii, HI
William W. Hay	GEOMAR, Kiel, Germany, SCICOM Chair
Nils Holm	Stockholm University, Sweden (European Consortium for Ocean Drilling)
Steven D'Hondt	University of Rhode Island, RI
Jock Keene	School of Geosciences, University of Sydney (PACRIM Consortium)
Emily Klein	Duke University, Durham, NC
Ken G. Miller	Rutgers University, New Brunswick, NJ
David Rea	University of Michigan, Ann Arbor, MI
Alistair Robertson	Dept. of Geology and Geophysics University of Edinburgh, UK
Hidekazu Tokuyama	Kyoto University, Japan
Doug A. Wiens	Washington University, St. Louis, MO
Jim Zachos	University of California, Santa Cruz, CA

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Peggy Delaney	University of California, Santa Cruz, CA (Chair Conceptual Design Committee)
John B. Diebold	Lamont-Doherty Earth Observatory, Palisades, NY (Chair SSP)
John Farrell	Joint Oceanographic Institutions, Inc., Washington DC
Jeff Fox	Science Operator (ODP-TAMU), Texas A&M University, TX
Roy Hyndmann	Geological Survey of Canada, Sidney, B.C., Canada (Chair SEIZE DPG)
Tom Janecek	Florida State University, Tallahassee, FL (Chair SciMP)
Hajimu Kinoshita	Japan Marine Science and Technology Center (JAMSTEC), Japan
Kazuhiro Kitazawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Shin-ichi Kuramoto	STA, Japan
Charles Langmuir	Lamont-Doherty Earth Observatory, Palisades, NY (Chair AOL PPG)
Neil Lundberg	Florida State University, Tallahassee, FL (Chair ESSEP)
Ted Moore	University of Michigan, Ann Arbor, MI (Chair IPSC)
Julie Morris	Washington University, St. Louis, MO (Chair ISSEP)
John Parkes	University of Bristol, UK (Chair Deep Biosphere PPG)
Charles Paull	Monterey Bay Aquarium Research Inst., CA (Chair Gas Hydrate PPG)
Nicholas Pisias	Oregon State University, Corvallis, OR
Warren Prell	Brown University, Providence, RI (Leg 185 Co-chief)
Mary Reagan	Lamont-Doherty Earth Observatory (Wireline Logging Services), Palisades, NY
Thomas Shipley	Institute for Geophysics, University of Texas at Austin, TX
Kiyushi Suyehiro	Japan Marine Science and Technology Center (Leg 186 Co-chief)
Masanori Shinano	IWG Support Office, Washington DC
Shin-ichi Takagawa	Japan Marine Science and Technology Center (JAMSTEC), Japan
Takeo Tanaka	OD21 Program Office,Japan Marine Science and Technology Center (JAMSTEC)
James D. Wright	Rutgers University, New Brunswick, NJ (Climate Tectonics PPG)
Robert Winokur	JOI-CORE, Washington DC

OPCOM Participant List

Members	
William W. Hay	GEOMAR, Kiel, Germany, OPCOM Chair
Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, FL
Nils Holm	Stockholm University, Sweden (European Consortium for Ocean Drilling)
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Thomas Shipley	Institute for Geophysics, University of Texas at Austin, TX

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Jack Baldauf	Science Operator (ODP-TAMU), Texas A&M University, TX
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JOIDES Office	
W. Brückmann	Science Coordinator

Guests and Observers	
Dave Goldberg	Wireline Logging Services (ODP-LDEO), Palisades, NY

Meeting Schedule

Panel	Date	Place
SSP	23-25 Feb. 2000	Zurich, Switzerland
PPSP	13-14 Apr. 2000	New Orleans, LA
ESSEP	08-10 May 2000	Cambridge, UK
ISSEP	08-10 May 2000	Cambridge, UK
EXCOM	27-28 June 2000	College Station, TX
SSP	24-26 July 2000	Palisades, NY
OPCOM	02-05 Aug. 2000	Halifax, N.S. Canada
SCICOM	02-05 Aug. 2000	Halifax, N.S. Canada

Operations Schedule

Leg	Title	Port of Entry	
188	Prydz Bay	Fremantle	12 Jan. - 12 Mar. 2000
189	Southern Gateways	Hobart	12 Mar. - 13 May 2000
	Transit (Townsville-Guam)	Townsville	13 May - 24 May 2000
190	Nankai I	Guam	24 May - 17 July 2000
191	W. Pacific Ion/HD Engineering	Yokohama	17 July - 13 Sep. 2000
192	Ontong Java	Guam	13 Sep. - 9 Nov. 2000
193	Manus Basin	Guam	9 Nov. 2000 - 6 Jan. 2001
194	Marion Plateau	Townsville	6 Jan. - 2 Mar. 2001
195	West Pacific Ion	Guam	2 Mar. - 8 Apr. 2001
196	Nankai II	Kaohsiung	8 Apr. - 7 Jun. 2001
197	Hotspots	Yokohama	7 Jun. - 1 Aug. 2001
198	Gas Hydrates	Dutch Harbor	1 Aug. - 30 Sep. 2001
199	Paleogene	San Francisco	30 Sep. - 29 Nov. 2001
200	H2O	Honolulu	29 Nov. 2001 - 6 Jan. 2002
201	SE Paleoceanography	Panama City	6 Jan. - 3 Mar. 2002

Special Events for the EXCOM/SCICOM/OPCOM/PANCH Meeting

Monday, February 14th

18:00-20:00 **Icebreaker Reception**

Colonnade Room, Washington Monarch Hotel
2401 M Street NW

Tuesday, February 15th

18:30 - **Cocktails and EXCOM/SCICOM Dinner**

Colonnade Room, Washington Monarch Hotel
2401 M Street NW

Wednesday, February 16th

17:30-19:30 **Reception and Ocean Drilling Seminar:**

Science and Drilling Technologies for the Future
by Drs. Ted Moore and John Armentrout

Canadian Embassy
501 Pennsylvania Avenue NW
At the intersection of Pennsylvania and Constitution Avenues,
across from the National Gallery of Art.

Friday, February 18th

9:00-12:00 **AAAS Symposium:**
Unearthing Climate Variability from the Geologic Record

Marriott Wardman Park, 2660 Woodley Road NW and Omni Shoreham,
2500 Calvert Street NW

Speakers:
Climate History Research in the Ocean Drilling Program, *K. Moran*

Unraveling the History of Oceanic Variability, *J. Farrell (on behalf of L. Mayer)*

Recent Climate Change in the Antarctic: Sediment Records from Palmer Deep, *E. Domack*

Climatic and Oceanographic Change - Evidence from Coastal California, *R. Behl*

Millenial-Scale Climate Records from the Anoxic Cariaco Basin, *L. Peterson*

Millenial-Scale Climate Change in the Western North Atlantic, *L. Keigwin*

EXCOM/SCICOM Joint Meeting

9:00 A. Welcome, Introductions, Logistics (Beiersdorf, Moran)

B. Approval of Agenda of Joint Meeting (Beiersdorf)

9:30 C. Selected ODP Achievements (Hay)

10:00-10:30 Coffee Break

10:30 D. NSF/ODP Council Report (Malfait) **TAB1**

10:50 E. Country/Consortium Reports (To be taken as read) **TAB2**
All national representatives will introduce themselves and make additions as necessary.

11:15 F. ODP Management and Operations Report (Moran) **TAB3**

11:55 G. SCICOM Report, Amendment of Terms of Reference (Hay) **TAB4**

12:15-1:30 Lunch

1:30 H. Partnerships with ODP
- H1. ICDP (Mutter, Hay)
- H2. Industry (Beiersdorf, Briden, Moran)
- H3. Other Scientific Initiatives
- H4. Distance Learning Initiative (Baldauf)

2:30-3:00 Coffee Break

3:00 I. IODP Planning
- I1. OD 21 Report (Taira)
- I2. USSAC CDC Progress Report (Delaney, Malfait)
- I3. Report on European Initiatives (Beiersdorf)
- I4. COMPLEX Report (Pisias)
- I5. IPSC Report (T. Moore)
  - Science Panning WG
  - Technology WG
  - Industry Liaison WG

5:00 Adjournment

EXCOM

8:30 A. Approval of June 1999 EXCOM Minutes and Matters Arising (Beiersdorf) **TAB5**

8:40 B. ODP Phase Out / ODP-IODP Transition (Beiersdorf) **TAB6**

9:00 C. IPSC Report – Discussion (All)

10:00-10:30 Coffee Break

10:30 D. Continuation of Discussion of IPSC Report, with Presentation of SCICOM Suggestions

11:30 E. Approval of FY 2001 Science Plan (Hay) **TAB7**

12:00-1:30 Lunch

1:30 F. Approval of FY 2001 Preliminary Budget (Moran)

2:00 G. Evaluation of Joint Meeting (All)

2:15 H. Other Business
Farewell to Briden
Farewell to Nowell

2:30 I. Time and Place of Next Meeting

2:45 Adjournment

SCICOM

(Part, Acting as Subcommittee, Chaired by Mike Coffin)

8:30 A. Formulate Questions and Comments Regarding IPSC to be Forwarded to EXCOM

10:00-10:30 Coffee Break

10:30 B. Appointment of Liaisons to Other Panels

11:30 D. Other Topics

12:00-1:30 Lunch

PANCH

(with Miller and Klein from SCICOM), Chaired by John Diebold

8:30 A. Develop Policy on Panel and Committee Minutes on the Web

10:00-10:30 Coffee Break

10:30 B. Other Matters

12:00 Adjournment

12:00-1:30 Lunch

OPCOM

(Chaired by N. Pisias)

8:30 A. Update on Items from August Meeting (Brückmann) **TAB8**

B. Update on Outstanding Issues (Baldauf)

C. Update on Drydock and Tests (Baldauf)

10:00-10:30 Coffee Break

D. Update on Budget for Upcoming Legs (Moran)

E. Status of HYACE Sea Test Plans (Baldauf) **TAB9**

F. Other Matters

12:00 Adjournment

12:00-1:30 Lunch

SCICOM/OPCOM Joint Meeting

(Chaired by Coffin, Pisias)

1:30 A. Update on Planning for Legs 190 and 196 (Nankai) (Baldauf) **TAB10**

B. Other Matters

2:30 Adjournment

Science Symposium (EXCOM/SCICOM/OPCOM/PANCH)

(Chaired by Hay)

3:00 Presentations by Mike Coffin, Alistair Robertson, Steve d'Hondt, Nils Holm, and Ken Miller

5:30 Adjournment

SCICOM/OPCOM

(Chaired by Hay, Pisias)

8:00	A.	Approval of August 1999 SCICOM Minutes and Matters Arising (Hay)	**TAB11**
8:00	B.	Leg Reports Leg 184 (Prell) Leg 185 (Ludden) Leg 186 (Suyehiro)	**TAB12**
10:00	C.	Panel Reports	
		C1. TEDCOM Report (Hay for Skinner)	**TAB13**
10:15		C2. SciMP Report (Janecek)	

10:30-11:00 Coffee Break

11:00	C3. SSP Report (Diebold)	
11:10	C4. PPSP Report (Ball)	
11:20	C5. SSEPs Report (Lundberg, Morris)	**TAB14**

12:00-1:00 Lunch

1:00	D.	SEIZE DPG Final Report (Hyndman)	**TAB15**
1:45	E.	PPG Final Reports:	
		E1. Architecture of the Oceanic Lithosphere (Langmuir)	**TAB16**
		E2. Climate and Tectonics (Wright)	**TAB17**

3:00-3:30 Coffee Break

3:30		E3. Gas Hydrates (Paull) E4. Deep Biosphere (Parkes)
4:45	F.	OPCOM Report (Pisias)
5:15	G.	SCICOM Subcommittee Report (Coffin)
5:30	H.	Time and Place of Next Meetings
5:45	I.	Other Matters
6:00		Adjourn

NSF REPORT

ODP

The Fiscal Year (FY) 2000 ODP Program Plan budget has been approved at a level of $46.1 Million, which includes a modest increase of $600,000 in Program Base costs above funding in FY 1999. It is expected that NSF will supply approximately 64% of FY 2000 funding, with the remaining 36% to be provided by international contributions. In FY 1998 and 1999, NSF provided $6M for needed improvements in operational capability and habitability aboard the JOIDES Resolution. Dry-dock activity was completed in early October 1999 and NSF is awaiting submission of a detailed report on modification and upgrading to the vessel. A final report on overall FY 1999 funding and obligations for the prime contract is also expected prior to the EXCOM meeting.

For FY 2001, NSF has given JOI a target budget of $46.1 million to support all 2001 program operations. This target will provide for level funding of program activity in 2001. JOI will provide EXCOM with a status report on development of the science plan for FY 2001 at the February meeting. EXCOM will need to approve the Program Plan and Budget at its June meeting in College Station, prior to submission of the plan to NSF on 1 August 2000.

Participation levels in FY 2000 for ODP partners have finally been resolved. Germany, the United Kingdom and Japan will continue at the full member level ($2.95M). France and the People's Republic of China will continue at their previously identified associate member levels (2/3 and 1/6 respectively). The PACRIM Consortium has reduced it's contribution from 11/12ths (FY 1999) to 5/6ths for FY 2000. The European Science Foundation has committed to participation at a level of 97.5%, though discussions are continuing for membership of Ireland in the consortium. Discussions have begun with the People's Republic of China to extend their ODP participation to the end of the program. The existing MOU with the PRC is presently scheduled to terminate at the end of FY 2000. There are no other formal discussions in progress with any potential new ODP members. It is expected that JOI will provide EXCOM with an update on the status of discussions with any potential additional partners.

Additional recent activities related to the ODP contract include the following: (1) JOI is required to maintain a manual of the policies and procedures that guide the operation of the ODP. A revised version of the manual should be distributed to EXCOM members in the near future. (2) NSF Contracting and Audit resolution offices are completing resolution of a "cost incurred" audit of ODP funding for the period 1994-1997. It is expected that only a minimal amount of questioned costs will be sustained (and recovered from JOI) in the final audit resolution. (3) FY 1999 has seen the first formal implementation of reporting requirements under the US Government Performance and Results Act (GPRA). The NSF Ocean Drilling Program provides both scientific and facilities input to this process, with JOI responsible for supplying required data on facility operations. The FY 1999 data supplied by by JOI indicates only minimal "user days" lost due to mechanical problems.

ODP COUNCIL

There have been no meetings of the ODP Council since Sydney in July 1999. At that meeting primary discussion items included the relation of scheduled science legs to JOIDES priorities, the availability of resources to support planned FY 2000 drilling, and the need to tie program results more directly to long range plan priorities. Additional discussion stressed the need for improved cooperation with industry and other international scientific drilling activity. The next meeting of the Council will be in College Station, Texas on June 29 in conjunction with the summer EXCOM meeting.

IWG

The International Working Group (IWG) for the Integrated Ocean Drilling Program last met in Freiburg, Germany, in March 1999. Results of that meeting were reported to EXCOM in Sydney. The next meeting of the IWG is scheduled for Washington, DC, on 17 February following the EXCOM meeting. Based on discussions in Freiburg, the National Science Foundation and the Science and Technology Agency have agreed to jointly finance an Interim IWG Support Office to provide support and assistance to the IWG in

planning activity for the IODP. The Office is co-located in the JOI offices in Washington, DC and began operations in January of this year.

E. COUNTRY REPORTS

E.1 AUSTRALIA – CANADA- CHINESE TAIPEI – KOREA ODP CONSORTIUM (PACRIM)

On January 1, 2000, the PacRim Secretariat moved to Sydney University in Australia, and all lead and alternate positions for the consortium were reassigned. Effective 1 October, 1999, the consortium dropped from 11/12 to 10/12 membership as Taipei reduced its stake from 1/6 to 1/12. Because of a weak Canadian dollar, Canadian funding agencies have given notice to consortium partners and NSF that Canada will not likely take a 1/3 stake in PacRim from 1 October, 2000, instead probably dropping to 1/4. These negative decisions regarding funding by PacRim government agencies are contrary to the direction suggested by the PacRim consortium board in May, 1999. At that meeting, board members unanimously passed a motion directing each national group to ask their funding agencies to increase contributions, on a pro-rated basis, sufficient to bring the consortium to full membership. This process was soon derailed by cuts or threatened cuts in Taipei and Canada.

Steps are underway in Canada to find a mechanism to guarantee a 1/3 stake for the rest of the program. The Canadian Secretariat, through Shiri Srivastava's efforts, has initiated discussions with India that could lead to that country taking a partial membership in ODP, but likely outside the PacRim grouping. Following the Australian model, Canada is creating a scientific committee using seven thematic groupings to promote development of proposals and increased participation. Chairs of each of the seven groups will present overviews of ODP advances and challenges at a Canada-wide geoscience meeting in Calgary in May/June 2000.

During 1999, ODP was prominent in the Australian scientific news propelled by exciting results from Legs 180 to 183. In general, support for ODP in Australia appears to be very high. Australia, through PROD, is pioneering different ODP

platforms and this will continue to broaden the interest base. Port call activities are planned for Fremantle in January and Hobart in March 2000. These activities include public tours of the JOIDES resolution and a VIP function at each location.

Korea's ODP SciCom met in September and discussed preparation of a proposal for drilling around the Korean continental shelf. SciCom also decided to provide a fund of ~$10,000 for ODP related research. Dr. Kyoung Woon Lee has retired from his position of the president of Korea Institute of Geology, Mining and Materials (KIGAM). The new chairperson of KODP Council is Dr. Young Hwoon Kwak.

Dr. Kuo-Yen Wei, professor in the Department of Geology, National Taiwan University, is the newly elected chairman of the Chinese Taipei ODP Consortium.

E.2 ECOD

ECOD (June 1999-January 2000)

MANAGEMENT MATTERS

1. ECOD representatives and meetings

The 16th and next meeting of EMCO will be held in Granada, Spain, on Friday 12 May 2000.

2. ECOD web site

The ESCO Secretariat has updated (October, 1999) his web site
http://diamant.geo.su.se/ESCO_ODP/ESCO_WEB/index.htm:
1) an EMCO page has been added; and 2) a new page
http://diamant.geo.su.se/ESCO_ODP/ESCO_WEB/Facilities_ECOD.htm
is dedicated to advertising laboratory facilities owned by individual scientists, laboratories, divisions, departments, etc., within ECOD and other universities that are interested in conducting measurements for other scientists, or in receiving visiting investigators. The goal is that this web site will favor increasing cooperation among ECOD scientists (and others).

3. Status of Phase III

The ESF has received confirmation from the Irish research council "Enterprise Ireland" that Ireland will join ECOD. The Irish membership would probably involve the Geological Survey of Ireland, the Marine Institute and Enterprise Ireland. The Irish contribution to ECOD could probably progress from 1.6 % in 2000 to 2% in 2001 (amounts given in % of the total ECOD contribution). The above would mean that as of 2001 ECOD would be able to contribute 99.5% of a full contribution.

RELEVANT ACTIVITIES ON POST-2003 PLANNING

1. ECOD "letters of intent" status

EMCO at its last meeting (March 1999) agreed on the ECOD interest for being involved in the planning efforts of IWG. The last ESCO meeting (October 1999) recommended its ECOD delegates to contact their respective EMCO delegates and urge them to write a letter of intent to the IWG/IODP and to agree for an ECOD joint letter. The ECOD-ESF office has received formal or informal positive responses from Belgium, Denmark, Finland, Iceland, the Netherlands, Norway, Portugal, Spain, Sweden and Switzerland. Thus, all ECOD countries except Italy have agreed for sending a "joint letter of intent" to participate into IODP planning; furthermore, the Nordic countries have agreed to send a joint letter. The individual member countries are supposed to send directly letters of intent to NSF and Japan if no consensus was achieved within ECOD.

2. ECOD proposal

In order to speed up the process towards European participation in post-2003, different initiatives were discussed at the 17th ECOD workshop and ESCO meeting (October 1999) in response to Item 4 of the meeting of the European Science and Technology Advisory Group (ESTAG-OD, Sydney, 30 June 1999). It was decided to initiate investigations to formulate European scientific objectives that can be presented to funding agencies and politicians. The ECOD proposal on this ragard included:

- A Scientific Working Group of European SCICOM members, with input from European IPSC and IPSC. Working group members produce a scientific document for 31 December 1999, which emphasizes new scientific opportunities for Europe for post-2003 related to international partnership involving the Japanese riser drill ship, the US riser-less drill ship, and other platforms.

- To set-up a science and technology committee (included industry) for other "special" and drilling technology platforms than JR replacement and OD21 riser drill-ship. The committee should investigate possibilities of the "special" platforms (referred to various kinds of equipment available in Europe) as a part of IODP. To produce a report before 31 December 1999.

- An ESF Workshop to discuss the politic and scientific future of ocean drilling in Europe. A report should be produced from this workshop by the end of January 2000 (see below).

3. ESF action

The ESF agreed in organizing a workshop in Strasbourg on 27 January 2000 that will work out a European strategy for future ocean drilling. This workshop will

involve, among others, the European Science and Technology Advisory Group on Ocean Drilling (ESTAG-OD), European SCICOM members and ESF & EU representatives, so that all the necessary scientific and political strategy issues could be covered. The workshop would be based on the material produced by the two above-mentioned groups (as in Item 2.).

- ECOD representatives plan to participate in the ESF workshop for discussion on the political and scientific future of ocean drilling in Europe, and seeking for a common European approach towards membership in IODP. A report drafting the European interest and plan, linked with the IODP Science Plan, should be finished by the end of January 2000 and would be given to the IWG meeting in February 2000 and the Euro-ODP Forum in April 2000.

SCIENTIFIC MATTERS

1. Meetings / news

(a) The last ECOD Scientific Committee met in Amsterdam 3 October 1999, in conjunction with the 7th ECOD workshop. ESCO invited France as an observer to this meeting and ODP-France reciprocates with an invitation to ECOD at its scientific meeting.

(b) The 7th ECOD Workshop, hosted by Jeroen Kenter and Simon Troelstra of Free University, was held in Amsterdam 29 September to 2 October 1999. Two themes were addressed, "ECOD Highlights", involving major accomplishments by ECOD scientists, and "Drilling Beyond 2003". A total of 60 participants attended the meeting.

(c) The next ESCO meeting will be held in conjunction with the Euro-ODP Forum meeting in France in April 2000.

(d) Piera Spadea organized the ISSP and ESSP meetings in Udine, Italy, 1-3 November 1999.

(e) Flavio Anselmetti will organize the SSP meeting in Zurich, Switzerland, 23-25 February.

(f) ECOD scientists are involved as co-proponents in eight active ODP proposals:
533-Full2 Paleoceanographic and Tectonic Evolution of the Arctic
547-Full Oceanic Subsurface Biosphere
551-Full exploring the Plutonic Crust of a Fast-Spreading Ridge
557-Pre Norwegian Margin Gas Hydrates
558-Pre2 Tsunamogenic Structure Offshore SW Iberia
573-Pre Modern Carbonate Mounds
574-Pre Rainbow Hydrothermal Field
575-Full Gulf of Aden

2. ODP Legs

(a) ECOD scientists sailing now/and from June 1999

Leg 186 (Jun-Aug):
Maria Ask, Sweden (PP specialist and JOIDES Logger)

Leg 187 (Nov 99-Jan 00):
Ingunn Thorseth, Norway (geochemist, petrologist)
Kristine Lysnes, Norway (microbiologist)
Massimo D'Antonio, Italy declined a late invitation

(b) ECOD scientists invited to sail

Leg 188 (Jan-Mar 00):
Carl Fredrik Forsberg, Norway (PP specialist)
Michele Rebesco, Italy (sedimentologist, seimologist)
Kari Strand, Finland (sedimentologist, stratigrapher)

Leg 189 (Mar-May 00)
Caroline Pellaton, Switzerland (geochemist, sedimentologist)
Hendrik Brinkhuis (Netherlands)
Marianne Grauert (Denmark)

Leg 190 (May-Jun 00)
Mario Sanchez-Gomez, Spain (petrologist, structural geologist)

(c) ECOD co-chief invited during 1999

Leg 187:
Rolf Birger Pedersen, Norway

(d) ECOD co-chief invited for upcoming Legs

Leg 193
Fernando Barriga, Portugal

(d) ECOD Student Trainees: participation and application

No student trainees from ECOD have participated on ODP legs since Leg 183. Seven student applications have been received for Legs 188 to 193.

E.3 FRANCE

ODP-France update. 14/01/2000

- A letter was sent in October 99 by V. Courtillot on behalf of the Ministère de la Recherche to Drs Purdy and Murakami (co-chairs of IWG) to express France's interest in IODP. The letter states that France's participation should be organized within a European consortium.

- J. Ludden (chair ODP-France) and C. Mével (France's EXCOM observ.) have attended the fall meeting of the European Consortium for Oceanic Drilling (ECOD) in Amsterdam. IODP planning was discussed and a scheme for how to go forward at the European level was developed. As an outcome of this discussion, the European Science Foundation (ESF) agreed to organize a Workshop on the Future of the European participation in Ocean Drilling. This workshop will take place in Strasbourd on Jan. 27th.

- ODP-France is in charge of convening this year's Euro-ODP forum ("Euro-ODP 2000") that will take place at La Grande-Motte, near Montpellier, April 10th and 11th.

- C. Mével is rotating off as France's observer in EXCOM. M. Cannat is taking over.

E.4 GERMANY

The Geokommission as the prime advisory commission to DFG on geoscientific matters at its regular meeting on April 29, 1999 recommended to DFG to send a "Letter of Intent" to IWG, stating that Germany will continue to participate actively in the working groups for IODP implementation and will seek appropriate mechanisms and approval in Germany for membership in IODP.

Meanwhile this „Letter of Intent" was submitted by DFG to Dr.Purdy (NSF), with copy to Dr. Murakami (STA), Co-Chairmen of IWG. The letter was jointly formulated by DFG and the Bundesministerium fuer Bildung und Forschung (BMBF), the other funding agency for the German Initial Contribution to ODP. In this letter it is stressed that there is a need for increasing the scientific and technological collaboration between IODP and the International Continental Drilling Program (ICDP). It is recommended that a science-based coordinating committee is formed to identify common scientific goals and scientific programs, coordinate technology needs and capabilities, and seek common organisational and funding structures. The „Letter of Intent" builds on a preceding „Letter of Interest", which became the basis of Germany's membership in IWG, and was based on the strong desire of the German ocean drilling community to join a program with the broad scope and goals of IODP.

The German ocean drilling community hails the progress being made in the development of IODP. The German ocean drilling community as well as funding

agencies expect from the IODP Science Plan that it follows the recommendations of CONCORD and COMPLEX, because most of that science which is of particular interest to the German geoscientific community in general, and to the ocean drilling community in particular, was taken up by these recommendations. The Draft IODP Science Plan (if available then) will be discussed by the participants of the Annual German ODP Kolloquium February 23-25, 2000 in Jena/Germany. As usual the meeting is open to non-German participation. DFG will support the travel of a number of scientists from other European countries and outside Europe and has issued invitations already.

Like many other European earth scientists also a vast majority of the German ocean drilling community has signed „The Oldenburg Declaration" (Reference: TERRA NOSTRA, 96/4, Cologne, Germany, 1996; ISSN 0946-8978) which asks the decision makers in European science planning, funding agencies, public services, and industry to support the ODP Long Range Plan, which envisages an ODP Phase IV with riser-drilling capabilities (and ultimately led to the IODP initiative). The German ocean drilling community continues to support a close cooperation within the European ocean drilling communities and will participate with a significant contingent in the Ocean Drilling EuroForum taking place April 10/11, 2000 in Montpellier (France), where, beside science, steps for a common European appraoch to future ocean drilling will also be dicussed.

DFG and the Coordinating Office of the DFG Priority Program ODP/DSDP have organised an ODP-INDUSTRIE-FORUM. It was held at BGR/Hannover (Germany) November 18, 1999, with the objective to foster the dialogue between scientists from industry and academia in Germany. Among the 34 participants 15 came from industry. Prominent scientists from the German ocean drilling community gave lectures on the following themes:

- Architecture of continental margins
- Signatures of gas and fluid bearing sediments in high-resolution seismic records
- Marine gas hydrates
- Genesis of hydrocarbon source rocks: example mid-cretaceous black shales
- Logging in ODP
- Integrated stratigraphy and computer-assisted data evaluation in the „Ocean Drilling Stratigraphic Network"
- Orbital climatic tuning as stratigraphic tool in „deep time"
- Control of sea level variations on sedimentary architectures
- Drilling targets of ODP until 2003 and IODP

The reaction by the industry representatives was very positive. It was agreed that more meetings of this scope will be organised aiming at formulating common projects.

Next spring Helmut Beiersdorf, who served for more than two decades as Coordinator of the DFG Priority Program ODP/DSDP, will step down from this post. He will hand over this responsibility to Dr. Herman-Rudolf Kudrass, Head of „Marine Geology, Deep-Sea Mining" of BGR. H.-R.K. acted already as alternate for H.B. in his capacity of Coordinator, and also served the drilling programme as member of the JOIDES Planning Committee and Western Pacific Panel. H.B. will continue to represent ODP Germany in the JOIDES Executive Committee.

BGR has conducted geophysical survey work off Costa Rica with R/V PROFESSOR POLSHKOV in November 1999, which included 7 multi-channel seismic lines in support of the proposal „Drilling the Proto-Seismogenic Zone with JOIDES RESOLUTION" (R.von Huene, C.R. Ranero, E.Flueh, K.Hoernle, K.Hinz, I.Pecher, D.Scholl, E.Silver), which was submitted to the JOIDES Office 15 March, 1999.

Industry lines from the Demerara Rise are being processed at BGR in support of the proposal „Equatorial Cretaceous and Paleogene Depth Transect of Demerara Rise, Western Central Atlantic" (J.Erbacher, R.Norris, P.Wilson).

E.5 JAPAN

The Japanese Country Report is not available at present. An oral report will be presented at the EXCOM Meeting.

E.6 THE PEOPLE'S REPUBLIC OF CHINA

June 1999-January 2000

China ODP Executive Committee

Post-cruise Activities of ODP Leg 184

Currently, the first priority of ODP activities in China belongs to the post-cruise studies of Leg 184 materail. Six scientists (Drs. JIAN Zhiming, SHAO Lei, SU Xin, LI Anchun, WU Bihao and ZHU Youhai) joined the post-cruise sampling party at TAMU. All together, Chinese scientists applied for 16000 samples for analysis covering micropaleontology, polynology, sedimentalogy and geochemistry. So far, Chinese scientists has obtained ca. 9000 samples. ca. 2000 more samples from site 1143 were transferred from University of Hokkaido, Japan to Tongji University for high resolution isotopic analysis.

The National Natural Science Foundation of China (NNSFC) has granted considerable amount of research funds to a group of scientists for ODP-184 related researches to secure high standard research outcomes from Leg 184. The research is coordinated by Prof. WANG Pinxian from Tongji University. More than 40 scientists and postgraduates have been heavily involved in the reaserch. Many

laboratories are engaged in core analyses, including those from: Tongji University, Nanjing University, Chinese University of Geoscience (Beijing), and four research institutes from Chinese Academy of Science. Two issues of "ODP Leg 184 Research Newsletter" have been published by the State Laboratory of Marine Geology, Tongji University which highlighted the resaerch progresses. The newsletter also serves as a good means to communicate and coordinate among researches to ensure that the ODP Leg 184 -related researches within the country be carried out in a systematic framework.

As part of the effort to obtain first-rate research results from Leg 184, a workshop on "Identification of Pollen in Deep Sea Sediments" was held at the Resarch Institute of Botany, Chinese Academy of Science in October 1999. A second workshop on "Diatoms and South China Sea Paleoceanography Research" was organized by Tongji University in late October 1999. Both workshops succeeded in setting up standards among Chinese researchers on issues such as the sample preparation, counting, classification and data record format.

ODP-China in the New Century

To broaden the scientific spectrum of China's participation in ODP activities, ODP-China have been encouraging earth scientists, especially the young ones in the nation to participate actively in diversified research areas. ODP-China is also seeking relevant government agencies to grant research funds for subjects that related to both the interior and exterior dynamics of the earth, in particular, subjects such as deep biosphere and gas hydrate that are of significant societal relevance.

ODP-Chine has decided to organize an ODP Short Course at Tongji University in the summer of 2000. Young scientists covering a vast stretch of research areas will be participated in the course.

Prof. WANG Pinxian, ZHOU Zuyi from Tongji University and Dr. CHEN Muhong from South China Sea Research Institute participated in the COMPLEX. ODP-China is considering to translate the report into Chinese as part of its effort to attract more promising scientists to be involved in ODP related academic acticities.

General Issues

In order to promote ocean drilling studies in China, ODP-China tries to invite various ODP committees and panels to have their meetings in China. We are pleased to learn that the ODP-China SciCom's meeting will be held in Shanghai in spring 2001.

The ODP-China SciCom meeting is held on 12 Jan. 2000 in Beijing. During the meeting, the members of the ODP-China SciCom reviewed the report on the progress of ODP 184 related researches, and discussed the plan of the ODP-China for 2000-2003, the proposal for activites of the ODP-China in the new century.

Prof. YAO Bochu (Chinese member of SSE) attended the SSP meeting in July,1999 .Prof. ZHOU Zuyi attended the SCICOM/EXCOM meeting at UCSC in August, 1999. This is the first time that China, as an associate member of ODP, send an observer to the SCICOM/EXCOM. Porf. ZHOU (Chinese alternate member of ISSEP) also attended the ISSEP meeting in November, 1999.

Two issues of CHINA ODP NEWSLETTER (No. 2 & No. 3) has been published since May, 1999 by ODP-China SciCom and the State Laboratory of Marine Geology, Tongji University.

E.7 UK

1. ODP Special Topic Grants

The following ODP special topic grants have been awarded since the last EXCOM meeting

Dr. M.F Thirlwall (Royal Holloway) and Dr M.A.M Gee (Royal Holloway and Birkbeck): Mantle Dynamics of the boundary between the Pacific and Indian Ocean Mantle Domains

Dr. M. Maslin (UCL), Dr E. Platzman (UCL) and Dr T. Rosell-Mele (Newcastle): The role of the Benguela current upwelling system in controlling the intensification of Northern Hemisphere glaciation

Prof. J. Tarney (Leicester): Characterisation of the structure and geochemistry of oceanic crust at the Izu-Mariana convergent margin: implications for geochemical fluxes and mass balances at subduction zones

Dr T.S. Brewer and Dr P.K. Harvey (Leicester): Constraints in the structure of the Atlantis Bank SW Indian Ridge.

2. Technology Fund

Brewer and Harvey were funded from a new ODP technology funding programme (from within existing resources) . This was established in recognition of the technology led nature of ODP ands aims to ensure that technology based programmes to the benefit of the whole of ODP are funded. Brewer and Harvey are intending to reconstruct the Atlantis Bank core using core scanners and FMS (legs 176 & 179).

3. Fellowships

Dr G.G. Bianchi (Cambridge) was awarded a two year special fellowship to study Millennial-scale deep ocean circulation changes across the mid-Pleistocene climate transition which will include time spent at Woods Hole Oceanographic Institute

4. Post Doc-Funding

The first post-doc to receive special funding under the scheme announced at the last EXCOM meeting was awarded to Dr S. Barr (Leicester) for work on leg 185. Other applications are now pending.

5. UK Forum

The annual UK ODP forum was held at the Natural History Museum, London on October 21 1999 and attracted around 90 ODP researchers from all parts of the UK. The following keynote talks were presented:

Prof. Nick McCave (Cambridge) Flow through the SW Pacific Gateway for the last 32 Ma

Dr. Peter Barker (British Antarctic Survey) Leg 178 on the Antarctic Peninsula margin - towards Antarctic ice sheet history

Prof. Alan Kemp (Southampton) How the Mediterranean desert blooms (Saporels)

Dr Tim Brewer (Leicester) Core-log integration: a basement view

Alister Skinner (British Geological Survey & TEDCOM chair) Technology for Geology

In addition over 20 posters on all aspects of the programme were displayed and presentations by recent UK participants and on forthcoming drilling proposals were made. The meeting proved a great success.

6. UK ODP newsletter

Newsletter 25 was published in September 1999 in a new and eye-catching format, and distributed to the UK ODP community, UK earth science departments and international ODP offices.

7. IODP

At the request of NERC Council, an interim bid to NERC for funding of UK participation in IODP was submitted in October. Revised formal bid has been requested for September 2000. There is growing concern about the projected cost of IODP and the possibility of this being beyond the capacity of UK and others to cope with. NERC encourages work toward integrating European participation in IODP, and a further meeting if being held in ESF offices in Strasbourg on 27 January 2000 and will be reported at the EXCOM meeting.

E.8 USA

US COUNTRY REPORT (PART I)

Overall NSF funding for fiscal year 2000 shows a reasonable increase above FY 1999 levels, with NSF's overall budget scheduled to increase by approximately 6.5%. For Research and Related activities, the budget should increase by nearly 4.8% above the FY99 level. Within this overall increase, new or enhanced initiatives (Information Technology, Biocomplexity in the Environment, Plant Genome Research, and Arctic Logistics) account for a significant fraction of the growth. General "increases" in other research areas are expected to be on the order of 2% or less, with final budget distributions to Divisions and Programs still being determined.

The Ocean Drilling Program at NSF is presently planning on only level funding or minimal growth in FY 2000 activity. Focused NSF funding in support of U.S. ODP science is approximately evenly divided between the U.S. Science Support Program (USSSP, $6.4M in FY 2000) administered by JOI under a cooperative agreement with NSF and a separate unsolicited proposal/grant activity ($8.0M) at NSF that supports primarily field programs, experiments, and instrument development. NSF has recently completed review of the USSSP program for the remainder of the ODP. The cooperative agreement will be extended for a six year period to cover support of U.S. scientists through the end of drilling in 2003 and then an orderly phase-out of the program in following years. Overall funding is estimated at $23.9M. A discussion of recent activities of the USSSP can be found in a separate attached report from JOI.

Within the NSF unsolicited Grants Program, commitment to support CY 2000 field programs includes the following projects: (1) a high resolution MCS study of the Canterbury Basin New Zealand under the direction of Craig Fulthorpe (U. Texas); (2) an MCS study of the Costa Rica and Nicaragua being directed by Kirk McIntosh (Texas) as part of the NSF MARGINS initiative; (3) an MCS/OBS study of the Newfoundland Basin under the direction of Brian Tucholke and Steve Holbrook (Woods Hole and Wyoming) which is a cooperative program with Canadian and Danish scientists; (4) a detailed MCS study of the Blake Ridge under the direction of Steve Holbrook (Wyoming) to examine gas hydrate distribution; (5) a coring and seismic study of Neogene sediments in the eastern Pacific led by Alan Mix (Oregon State); (6) a 3-D high resolution MCS investigation of hydrates on Hydrate Ridge of the Oregon margin under the direction of Ann Trehu (Oregon State); (7) a jointly funded study with the NSF MGG program of off-axis fluid flow in Middle Valley of the Juan de Fuca Ridge (A. Fisher – Santa Cruz and others); (8) continuing experiments on borehole fluid flow and chemistry under the direction Becker (Miami), Carson (Lehigh) , Kastner (Scripps) and Spiess (Scripps). This work includes initial testing of a fly-in cork system for sealing boreholes without the need for the drillship using the Scripps re-entry vehicle. For FY 2001, the NSF ODP program has tentatively committed to support of field programs to examine: (1) rifting processes in the Gulf of Aden using MCS and

OBS techniques under the direction of Neil Driscoll (Woods Hole), John Diebold (Lamont) and Brian Taylor (Hawaii); and (2) crustal structure of megamullions on the Mid Atlantic Ridge using MCS equipment by Brian Tucholke (Woods Hole). Additional 2001 field programs will be evaluated at review panels in April (for the MARGINS initiative) and May.

The Marine Geology and Geophysics and Ocean Drilling Programs are providing support for establishment of Ocean Bottom Seismometer facilities at Scripps Institution and Woods Hole. The objective is for these facilities to provide instrumentation and technical support for the broad U.S. community. The NSF Major Research Instrumentation (MRI) program is supporting upgrading of the capability and number of instruments at the two institutions. Operations in support of funded projects should begin in 2001.

A workshop to examine the U.S. seismic reflection acquisition needs for the next decade was held at Scripps Institution in October. The workshop highlighted the increased seismic reflection acquisition that will be needed in support of developing initiatives (IODP, MARGINS, etc.) and is formulating recommendations on new technology and operational structures for future U.S. research. The workshop was convened by Tom Shipley (U. Texas) and Greg Moore (U. Hawaii). A report from the workshop is expected in the early spring.

U.S. COUNTRY REPORT (PART II)
JOI/USSSP ACTIVITIES 7/99 TO 1/00

JOI to continue managing USSSP The US NSF's National Science Board reviewed and approved the 6-yr USSSP Program Plan submitted by JOI in August. The Board approved an award of no more than $23.9 M for a 72 month duration. For specifics, see: http://www.nsf.gov/nsb/meetings/1999/nov/nsb99189/nsb99189.htm. The final version of the Year 16 Program Plan for the JOI/USSSP will be submitted to NSF in February 2000 for the contract year beginning March 1, 2000. This plan requests approximately $6.6M. A "close-out" report for the prior Year 15 will be submitted to NSF in the late Spring. The timing and duration of the USSSP is linked to that of the ODP. Wind-down of USSSP will begin in 2003 and will end completely by no later than February 28, 2006. Presuming US participation in the future Integrated Ocean Drilling Program (IODP), the US scientific community anticipates the creation of a successor program to USSSP, to support US participation in IODP.

JOI's Governing Board Grows The JOI Board of Governors grew by three additional members on July 1, 1999, when University of Michigan, College of Literature, Science & the Arts, University of Florida, and University of California, Santa Cruz, became the most recent members of JOI Inc. The continued expansion reflects JOI's recognition of the fact that US participation in the ODP has grown significantly beyond its initial ten institutions and that a broad base of US constituency support will be necessary

to create and foster a scientific ocean drilling program to succeed the ODP in the year 2003.

IWG Support Office On November 30, 1999, an interim International Working Group Support Office (IWGSO) was established in Washington, DC, by the Japan Marine Science and Technology Center (JAMSTEC) and Joint Oceanographic Institutions, Inc. (JOI) at the request of the Japanese Science and Technology Agency (STA) and the United States National Science Foundation (NSF). Additional information about the IWGSO is presented in the NSF Management Report. Detailed information will be distributed at the EXCOM meeting.

IWG Support Office
Suite 800
1755 Massachusetts Ave., NW
Washington, DC 20036-2102
www.iodp.org
iwgso@brook.edu

General inquiries should be directed to Jennifer Peterson (iwgso@brook.edu), Phone: 202-232-3900 ext. 262, Fax: 202-462-8754. The management representatives to the IWG Support Office are Masanori Shinano, JAMSTEC, mshinano@brook.edu, and John Farrell, JOI, jfarrell@brook.edu

Support for US participation in planning activities (e.g., IPSC) JOI/USSSP funds are being used to support Ted Moore, the Chair of the Integrated Planning SubCommittee (of SCICOM, thus IPSC), and his assistant Ms. JoAnne Reuss. Additional funds are being used to support US participation in IPSC meetings, IPSC Working Group meetings, and for other long-term planning activities.

USSAC subcommittee, "Conceptual Design Committee" To meet the objectives of a post-2003 ocean drilling program, the international scientific community has consistently emphasized that both riser (well-control) and non-riser drilling capabilities will be required. Japan is building a large (ca. 210 m, 50,000 ton) riser vessel meant to address some of these needs. As amply demonstrated at the COMPLEX meeting, a non-riser vessel, with enhanced capabilities, is also needed. NSF has said that it would seek the necessary resources to bring such a vessel to a future program. This vessel would constitute a major capital asset of the future Integrated (riser and non-riser platforms) Ocean Drilling Program (IODP). To accomplish this, the operational and scientific capabilities of this drilling vessel need to be carefully identified. NSF has requested that USSAC assist with this effort. In response to this request, USSAC has formed the Conceptual Design Committee (CDC). The CDC is chaired by Peggy Delaney and is comprised of Tim Byrne (U. Conn.), Steve Clemens (Brown U.), Susan Humphris (WHOI), Roger Ingersoll (Mobil), and Tom Janecek (Florida State U.). The CDC is also being assisted by a consultant, Brian Taylor (Jacques Whitford and Associates). Jamie Austin (UTIG) is the liaison to CDC from IPSC. Their final report is due to NSF on March

1, 2000. The CDC met in June and September 1999 and progress reports were presented by Susan Humphris to the JOI Board of Governors on Dec. 12, to the international scientific community, at the AGU ODP "Town Meeting", on Dec. 14th, and to IPSC on Dec. 17th.

USSAC membership rotation The following members successfully concluded their three-year terms on the U.S. Science Advisory Committee and rotated off on October 1, 1999. These members include: Mike Arthur (Chair), Tim Herbert, Rodey Batiza, Rob Dunbar, and Marv Lilley. Peggy Delaney was selected as the new Chair, effective October 1, for a two-year term. The new members of USSAC include: Tim Bralower (UNC Chapel Hill), Jon Martin (Univ. of Florida), Tommy Phelps (Oak Ridge National Lab), John Sinton (U. Hawaii), and Deborah Smith (WHOI). The next USSAC meeting is Jan. 19-21, 2000, in New Orleans.

K/T Educational Poster USSSP funded a reprinting of the "Blast from the Past" educational poster which focuses on the K/T impact event. The poster has a strong tie-in to the science from ODP Leg 171B, which recovered exquisitely preserved K/T boundary sequences.The reprinted version of the poster has new images of the meteorite and the impact site on the front, and a series of educational lab exercises and reference information on the back. Copies of the poster are available upon request from JOI, and copies will also continue to be distributed at JOI/USSSP Distinguished Lecturer Series host institutions (over thirty annually), international scientific meetings, workshops, public events (e.g., Ocean Drilling Seminar Series on Capitol Hill), and elsewhere.

Schlanger Ocean Drilling Fellowship Program Two one-year shorebased fellowships were awarded in July 1999. The recipients were Jennifer Latimer, Indiana University, for "The Influence of Dust Inputs on Biogeochemical Cycles in the Southern Ocean" (ODP Leg 177) and Michelle Shearer, Rice University, for "Quaternary carbonate preservation and dissolution in the Caribbean Sea" (ODP Leg 165). Ms. Shearer is the first student to be awarded the fellowship in pursuit of a Masters degree, as compared to a PhD.

Internship Program Alexandra Williamson, a summa cum laude graduate from Columbia University, with a BS in geology, worked at JOI from September to December 1999 as the first JOI/USSSP intern. She assisted with many of the activities conducted by JOI/USSSP, but she primarily worked on a project designed to collect, assemble and synthesize the scientific results of the DSDP and ODP as reflected in publications in four representative scientific journals: *Science*, *Nature*, *Geology*, and *Paleoceanography* over a five-year period, from January 1995 to January 2000. The purpose of this project is to assemble and assess the scientific "legacy" of the program, as represented by this small, but possibly representative subset of the scientific literature. By reviewing each issue of these publications, Ms. Williamson constructed a detailed electronic bibliographic database of all papers related to DSDP and ODP on a primary, secondary, and tertiary basis. Key words were determined and assigned and the papers were categorized on the

basis of the subdisciplines and initiatives outlined in the ODP Long Range Plan, published in March 1996. The publications were grouped into themes according to the LRP and to other planning documents such as the draft COMPLEX report. The database, an Endnote document, is available upon request, and is continuing to grow, thanks to ongoing efforts. Work is continuing on this project and more information will be distributed in the next report.

ODP Undergraduate Student Trainee Program JOI/USSSP funded the first US participant, Ericka Olsen, from the Univ. of Pennsylvania, to sail on Leg 186. Ms. Olsen's participation was considered to be a most positive experience for all, as indicated from her communication with JOI and through correspondence from her shipboard mentor, Gary Acton, an ODP/TAMU Staff Scientist. Ms. Olsen is currently studying the samples she collected on the leg for her senior thesis, which will focus on paleomagnetism and geomagnetism. One US student applied for Leg 187, but was not selected. Additional US applicants are anticipated for the upcoming year.

Gateways to Glaciation CD-ROM An alpha version of the CD-ROM was delivered by Educational Learning Facilitators (ELF) to JOI in November 1999. The version was reviewed by several people including JOI staff, the prior project manager, Ellen Kappel, a graphics consultant, and additional members of the scientific community, including Bob Duncan, who has assisted with the initiative since the beginning, and who is helping to oversee the development of an affiliated teachers' manual. Minor changes were considered necessary, and these have nearly been completed, as of January 14, 2000. The beta version is now scheduled to be delivered by ELF to JOI by the end of January, and the final, gamma, version is to be delivered by the end of February. Reproduction and packaging of the CD will occur in March, and JOI anticipates that the product will be available for distribution by April. The multimedia, educational CD is geared toward high school students and undergraduates. In it, students become participants on an ODP cruise to test the hypothesis that the closing of the Isthmus of Panama triggered the onset of significant northern hemisphere glaciation during the Pliocene. Students analyze cores in virtual shipboard labs and analyze data with shipboard scientists. When finished, the CD will be freely available from JOI.

JOI/USSSP sponsors science session and booth at AAAS Meeting

JOI/USSSP organized a session called "Unearthing Climate Variability from the Geologic Record", on February 18th, from 9 am to noon, at the annual meeting of the American Association for the Advancement of Science, to be held in Washington, DC. JOI/USSSP funds will be used to cover the travel expenses of six speakers, and to support an ODP promotional booth. The session will be at either the Marriott Wardman Park, 2660 Woodley Road, NW, or at the Omni Shoreman, 2500 Calvert St., NW. The specific location of the ODP Session will be available from the Program Book or On-Site Guide.

"Unearthing the Climate Variability from the Geologic Record"
Session 202.0 -- Organizer: Kathryn Moran (JOI)

Climate records reconstructed from ice cores and deep-sea sediments reveal large and abrupt millennial-scale climate fluctuations marked by rapid swings in air temperature, surface ocean conditions, and thermohaline circulation. A lively debate is taking place as to whether these oscillations are controlled by internal ice-ocean-atmosphere dynamics or by external solar or orbital forcing. All agree that additional high quality records of rapid climate change are needed to address outstanding questions.

The Ocean Drilling Program's unique hydraulic piston coring ability provides the scientific community with access to regions in the global ocean, such as off the coasts of Antarctica, Venezuela, western Canada, and California, and where detailed climate records with millennial and perhaps even centennial-climate variability are preserved in thick sediment sequences that accumulate rapidly. Scientists are characterizing the amplitude and frequency of climate cycles across a variety of time scales during intervals in earth history when there were large glaciers, smaller ice sheets, and even times when the climate was likely warmer than today. By studying such natural variability, we will gain a deeper understanding of climate processes which have the potential to influence our society.

- Kate Moran, JOI, "Climate History Research in the Ocean Drilling Program"
- Eugene Domack, Hamilton College, "Recent Climate Change in the Antarctic: Sediment Records from the Palmer Deep"
- Larry Peterson, RSMAS, "Millennial-Scale Climate Records from the Anoxic Cariaco Basin"
- Richard J. Behl, CSU, Long Beach, "Rapid Climatic and Oceanographic Change-Evidence from Coastal California"
- Lloyd Keigwin, WHOI, "Millennial-Scale Climate Change in the Western North Atlantic"
- John Farrell and Larry Mayer, JOI, UNH, "Unraveling the History of Oceanic Variability"

AGU Meeting JOI/USSSP co-sponsored and supported several activities at the fall meeting of the American Geophysical Union meeting, including an "ODP booth", and an "ODP Town Meeting". The meeting consisted of presentations by Kate Moran (JOI/ODP Director), Mike Purdy (NSF and IWG co-chair), Susan Humphris (CDC member), and Ted Moore (IPSC chair). The focus of the presentations was an update on the current and future activities of the ODP and the plans, progress, and timelines for the development of the various elements of the IODP. The event was widely considered to have been a success. Between 200 and 300 people attended the meeting (standing room only), which lasted nearly two hours. Much information was provided to the audience, mostly members of the scientific community, and a lively question and answer session occurred. Several participants thought that the atmosphere was upbeat, optimistic, and encouraging for the future of scientific ocean drilling.

Site Augmentation Proposals Funded

- John Diebold (Lamont Doherty Earth Observatory): "Site 1108 Seismic Data Augmentation", $57,850.

• Peter Clift (Woods Hole Oceanographic Institution): "Himalayan Uplift and the History of the Indian Monsoon Recorded in the Indus Fan", $25,032.

• Joris Gieskes (Scripps Institution of Oceanography): "*In-Situ* Sampling of Pore Fluids and Gases with the "Fisseler" Water Sampler – A Site Augmentation Proposal for Legs 190/192", $29,048.

• Maurice Tivey (Woods Hole Oceanographic Institution): "Geophysical Analysis of New Shipboard Data to Place Constraints on the Tectonic Setting of Atlantis Bank and ODP Site 735B", $47,483.

• Steve D'Hondt (University of Rhode Island): "Chemical Limits to Microbial Communities in Deep-Sea Sediments", $29,287.

Workshop Proposals Funded

• Chuck Nittrouer (University of Washington): "Source to Sink: MARGINS Science Plan for Sedimentology and Stratigraphy" ($21,375 requested from JOI; balance from NSF).

• Richard Murray (Boston University), Dan Schrag (Harvard University), and Geoff Wheat (University of Alaska, Fairbanks): "Opportunities in Geochemistry for Post-2003 Ocean Drilling", $39,500.

Post-Cruise Scientific Research Proposals From May 21, 1999 to January 15, 2000, 48 post-cruise scientific research proposals were formally approved for funding by JOI as part of the US Science Support Program.

JOI/USSAC Newsletter A fall issue of the newsletter was published and distributed. It can be viewed on-line, along with past newsletters, at www.joi-odp.org. Work is now underway on the March 2000 issue. A primary focus of the next newsletter will be to update the community on the planning process for post-2003 scientific ocean drilling. The distribution list for the newsletter, which has over 2000 addresses in the JOI/USSSP database, is being expanded to include an electronic list such that the readership can be contacted immediately, via email, about timely and fast-breaking news. A listserver (which would enable two-way communication) for this list is also being developed.

1999-2000 JOI/USSAC Distinguished Lecturer Series

Rodey Batiza

September 10, 1999	Georgia Institute of Technology, Atlanta, GA
September 13, 1999	Colby College, Waterville, ME
October 13, 1999	Univ. of Texas at Dallas, Richardson, TX
October 15, 1999	University of South Dakota, Vermillion, SD
October 18, 1999	Univ. of Wisconsin, Madison, Madison, WI

Steve D'Hondt

October 13, 1999	Rutgers University, Piscataway, NJ
November 10, 1999	University of Alabama, Tuscaloosa, AL
November 16, 1999	Vanderbilt University, Nashville, TN
November 18, 1999	University of Tennessee, Knoxville, TN
TBD	University of Miami, Coral Gables, FL
TBD	Stevens Inst. of Technology, Hoboken, NJ

Jeff Gee

January 21, 2000	University of Arizona, Tucson, AZ
January 27-28, 2000	University of Minnesota, Minneapolis, MN
February 3, 2000	University of Montana, Missoula, MT
February 10, 2000	University of Florida, Gainesville, FL
March 27, 2000	S. Dakota School of Mines, Rapid City, SD

Greg Moore

November 4, 1999	University of Oklahoma, Norman, OK
November 5, 1999	University of Memphis, TN
November 9, 1999	Humboldt State University, Arcata, CA
November 18, 1999	University of Idaho, Moscow, ID
November 23, 1999	California State University, Fresno, CA

Christina Ravelo

November 4, 1999	University of Cincinnati, OH
November 5, 1999	Indiana University, Indianapolis, IN
December 1, 1999	Lehigh University, Bethlehem, PA
December 2, 1999	University of Connecticut, Storrs, CT
February 7, 2000	University of South Carolina, Columbia, SC

Carolyn Ruppel

September 24, 1999	Penn. State University, University Park, PA
November 15, 1999	University of New Orleans, New Orleans, LA
February 28, 2000	University of Wyoming, Laramie, WY
TBD	University of Delaware, Newark, DE

2000-01 JOI/USSAC Distinguished Lecturer Series The six lecturers, their home institutions and their lecture titles are listed below. Applications to host these lecturers during the 2000-01 academic are due in mid-April. JOI expects at least 75 applications.

Timothy Bralower, University of North Carolina
"It was the Best of Times, It was the Worst of Times": Biotic Consequences of the Late Paleocene Thermal Maximum

Eugene Domack, Hamilton College
Late Quaternary Sedimentation in Antarctica's Palmer Deep

Martin Fisk, Oregon State University
Microbes Beneath the Ocean Floor and the Possibility of Extraterrestrial Life

Garry Karner, Lamont-Doherty Earth Observatory
The Paradox of Low-Angle Crustal Faulting and Rupturing of Continents

Delia Oppo, Woods Hole Oceanographic Institution
Millennial Scale Climate Variability in the North Atlantic

John Tarduno, University of Rochester
Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts

Japan Country Report

prepared by A. Taira

for EXCOM meeting, February, 2000, Washington D.C.

1. ODP Legs Especially Relevant to ODP Japan Activity

Leg 186: Successful installation of two borehole long-term seismometer/strainmeter/tiltmeter packages. Subsequent Dolphin 3K visit in September, 1999 in order to activate the system (connection with the seawater battery system). Co-chief: K. Suyehiro and S. Sacks

Leg 190: Study of the Nankai accretionary prism deformation trajectory. Co-chief: A. Taira and G. Moore

Leg 191: Borehole long-term seismometer installation in the northern Pacific oceanfloor planned. Co-chief: T. Kanazawa

Leg 192: Ontong Java Plateau. Site survey was supported by Hakuho-Maru.

Leg 195: The last leg of three leg series to complete the Ocean Hemisphere network initiative to install borehole long-term seismometer. The location is in the Philippine Sea plate.

Leg 196: ACORK and LWD experiments in the Nankai accretionary prism following Leg 190 drilling effort.

2. Site Survey Cruises

Japan-US R/V M. Ewing Nankai 3D seismics, June 18 to August 18, 1999: Co-chief scientists: N. Bangs (UTIG), S. Kuramoto (GSJ) and A. Taira (ORI).

Japan-France Eatern Nankai 3D seismics, June-July, 2000: ORI, JAMSTEC, Ifremer, ENS.

Hakuho-Maru, December 2000 to March 2001: Bengal Fan and the Gulf of Aden.

JAMSTEC Kaiyo seismic cruises in 1999 and 2000: Nankai Trough and Japan Trench seismogenic zones. 100 OBSs seismic tomography.

JAMSTEC Shinkai 2000 and 6500 dives along the Leg 190 transect in 1999 and 2000.

3. ODP/IODPScience and Promotion Activities

IODP Japan domestic committee (Kushiro committee) meeting, JAMSTEC Tokyo Office, October, 1999

Geological Society of Japan town meeting, Nagoya, October, 1999.

Dr. Don Heinrich's lecture, JAMSTEC Tokyo Office, October, 1999

OD21 Science Plan Workshop, ERI, Tokyo, November, 1999

ODP Japan national committee meeting, ORI, November, 1999

ODP Science Result Symposium (with IODP promotion), ORI, January, 2000

IODP domestic committee meeting, JAMSTEC Tokyo Office, February, 2000

Town meeting planned during Japan Earth and Planetary Sciences Joint Meeting, June, Tokyo.

Town meeting planned during AGU Western Pacific Geophysical Meeting, June, Tokyo.

4. OD21 Status

Basic design to be completed within a few months.

Budge approved: 70% of the total cost of construction(total cost = about 500 million $)

OD21 Japanese science plan to be completed within a few months.

OD21 science facility and science structure under discussion within Kushiro committee.

Nationwide OD21 promotion campaign in progress: lecture series and discussion meeting

EXECUTIVE SUMMARY

Highlights of Program activities over the past seven months include: successful completion of Leg 186, the *JOIDES Resolution* dry dock, and Leg 187. The deep biosphere initiative has continued with the installation of a permanent microbiology laboratory on the *JOIDES Resolution* and implementation of routine microbiology, including science and technical staffing. ODP industry partnerships initiatives have continued with the completion of a successful industry workshop. The new Program web pages are on-line and working well.

Leg 186 represented another landmark in ODP history with the deepest-ever casing installation and successful deployment of seismometers and strainmeters. Leg 187 accomplished all of its science objectives early and extended the number of sites drilled.

MANAGEMENT

Communication among Program managers has continued since the last EXCOM with conference calls among the prime contractor and subcontractors (JOI, TAMU, LDEO/BRG, and JOIDES Office) to review management issues and actions. In early October, ODP managers met with the NSF Program Directors to review program management and to outline the components of the FY2001 Program Plan and budget. JOI, TAMU, and LDEO met on January 27 & 28 to prepare the draft FY2001 budget for presentation to SCICOM.

The **Performance Evaluation Committee** (PEC) completed their report in October. The report will be presented at the EXCOM meeting.

The **ODP Industry Partnerships** efforts progressed well over the last few months. A successful industry-ODP workshop was held in Houston in October. The final report of the workshop is in preparation. Major outcomes were: preparation of joint industry/academia proposals, recommendation for a formal industry liaison committee in the ODP, and a follow-up workshop in Europe in FY2000. Partnership with HYACE, a MAST and industry-supported project for the development of downhole tools for hydrates and non-contaminating sampling is in its final stages. HYACE will undergo its first test on Leg 191.

The first **JAMSTEC/JOI Memorandum of Agreement** (MOA) project is the development of a new diamond core barrel that can be used by ODP and OD21. This joint development project is moving forward and testing of the first prototype was completed on Leg 185 and further testing will continue in FY00.

Program membership efforts have continued with **India.** On behalf of ODP, Shiri Srivastava visited India and spoke with lead agencies and the Oil and Natural Gas Company of India. India,

once again indicated their desire to join ODP. An ODP presentation was made to the largest industr geology group (**Canadian Society for Petroleum Geologists** – 800 people) on January 13. The presentation was focused on informing this community of ODP activities and canvassing their support of Canadian federal government funding for maintaining the PACRIM consortium at a full membership level.

Public Affairs supported the Yokohama (June 1999) port call. Activities were coordinated with the ODP/Japan Office led by Dr. Mamoru Enami and included a VIP ship tour for 171 guests, including five members of the Diet and other senior university, funding agency, and industry officials. More than 1,300 scientists, university officials, and students also toured the ship. ORI hosted an evening reception in honor of the ODP participants. Media coverage of port call events included five television stations and six newspapers and science journals. ORI also sent a film crew to the ship during the initial stage of Leg 186 to collect footage for an upcoming promotional video on OD21.

News Media Highlights: Michael Woods, science writer for the **Pittsburgh Post-Gazette** and **Toledo Blade** joined the NSF congressional members during their visit to the *JOIDES Resolution* on 10 August. His story about ODP and operations aboard the ship was published in the 22 August issue of the Toledo Blade and 30 August issue of Pittsburgh Post-Gazette. The story was also distributed on the **Scripps Howard News Wire** to more than 700 newspapers nationwide. The **Oil and Gas Journal** published a story in the 16 August issue regarding deep-ocean drilling and quoted Dr. Jay Miller, ODP Staff Scientist. Another article published in the 4 October issue discussed ODP research on gas hydrates. A Japanese magazine, **SCIaS**, published a ten-page article in the August issue on ODP and public relations events during the June Yokohama port call. Andrew McBarnet, a reporter with **First Break**, attended the COMPLEX meeting in Vancouver, Canada and wrote an article in the September issue discussing the accomplishments of DSDP and ODP, and the future initiatives of IPOD. Alan Kennedy, editor of **geoDrilling**, published an article in the 6 December issue on ODP drilling tool development. **Offshore Magazine** published an article on ODP research of gas hydrates for the August 1999 issue. The Swedish magazine **Forskning&Framsteg** published a story in the January 2000 issue on ODP Leg 171B and quoted Dr. Richard Norris, Co-Chief Scientist on that leg.

An **Ocean Drilling Seminar Series** on Capital Hill was organized to raise the profile of ODP science and to provide a forum for interaction among EXCOM, U.S. government officials, and member-country science liaisons located at embassies in Washington D.C. Audiences have included relevant US Congressional staff, government agencies' personnel, and embassy leaders in Washington, D.C. The objectives of the Series are to:

- demonstrate the value and relevance of ODP; and
- promote name recognition and an understanding of the international nature of the current and future Programs, and celebrate 30 years of excellence in ocean research.

Science themes that are relevant to the public and policy-makers were selected for the first three seminars and the wrap up seminar Series is a look to the future Program. The first three were held on Capitol Hill:

- Alan Mix (OSU): Understanding Past Global Climate Change, Nov. 16, 1999
- John Hayes (WHOI): Exploring the Earth's Deep Biosphere, Dec. 7, 1999
- Steve Holbrook (Univ. of Wyo.): Gas Hydrates: Linking Energy, Climate and the Biosphere, Jan. 10, 2000

The final seminar is scheduled to be held at the Canadian Embassy coincident with the EXCOM/SCICOM joint meeting. The Embassy is close to Capitol Hill, thus attractive to Congressional members and staff as well as ambassadors and their science attachés. The final seminar is:

- Ted Moore (Univ. of Michigan) & John Armentrout (Mobil/Exxon): Science & Drilling Technologies for the Future, Feb. 16, 2000, Canadian Embassy, 5:30 – 7:30 PM

A color, glossy brochure was printed and distributed, and is available at: www.oceandrilling.org/odss

Year 2000 (Y2K)

There were no Y2K problems as ODP moved into the year 2000. ODP/TAMU implemented a new email system that is Y2K compliant in November, 1999. ODP/LDEO modified the procedure for conventional and FMS log processing using GeoFrame software because the Vax-based package was not certified as Y2K compliant. The new procedures were tested during Leg 186 and will be implemented on the current Leg 188.

Personnel Changes

Tadeus Gladczenko was hired as the Technical Program Associate at JOI. Tad is responsible for overseeing the ODP web pages and computer support at JOI.

Carol Kokinda joined JOI as the new Director of Contracts & Grants.

Guy Spence left his Logging Scientist position at LUBR.

Moe Kyaw Thu was hired at ORI as a Logging Scientist.

Samantha Barr and Heike Delius were hired to fill the Logging Scientist positions at LUBR.

SCIENCE PLANNING

In August, SCICOM selected proposals for Legs 194 through 210. In November, the following schedule was prepared.

Leg	Port of Origin	Dates[4]	Total Days[1] (Port/Sea)	Sea Days (Transit/On Site)
187: Australian/Antarctic Discordance	Fremantle	15 Nov 1999 - 12 Jan 2000	58 (5/53)	15/38
188: Prydz Bay	Fremantle	12 Jan - 12 March 2000	60 (5/55)	22/33
189: Southern Gateways	Hobart	12 March - 13 May 2000	62 (4/58)	12/46
Transit (Townsville-Guam)	Townsville	13-24 May 2000	11 (3/8)	8/0
190: Nankai I	Guam	24 May - 17 July 2000	54 (1/53)	7/46
191: W. Pacific Ion/Engineering	Yokohama	17 July - 13 Sept 2000	58 (5/53)	12/41
192: Ontong Java	Guam	13 Sept - 9 Nov 2000	57 (5/52)	12/40
193: Manus Basin	Guam	9 Nov 2000 - 6 Jan 2001	58 (5/53)	9/44
194: Marion Plateau	Townsville	6 Jan - 2 March 2001	55 (5/50)	13/37
195: West Pacific Ion	Guam	2 March - 8 April 2001	37 (5/32)	7/25
196: Nankai II[2]	Kaohsiung	8 April - 7 June 2001	60 (5/55)	9/46
197: Hotspots	Yokohama	7 June - 1 August 2001	55 (5/50)	15/35
198: Gas Hydrates[2]	Dutch Harbor	1 August- 30 Sept 2001	60 (5/55)	9/46
199: Paleogene	San Francisco	30 Sept- 29 Nov 2001	60 (5/55)	19/36
200: H2O	Honolulu	29 Nov2001 - 6 Jan2002	38 (5/33)	18/15
201: SE Paleoceanography[3]	Panama City	6 Jan - 3 March3 2001	56 (5/51)	21/30

Notes:
[1] Although 3 to 5 day port calls are generally scheduled, the ship sails when ready.
[2] Mid-leg port calls may occur for Legs 196 and 198.
[3] Leg 201 is tentatively scheduled to end in Valparaiso.
[4] Start date is the beginning of the leg's port call.

SCIENCE OPERATIONS

Leg 185 The Subduction Factory at the Izu-Mariana Margin and the Deep Biosphere

Subduction zones are the primary regions on Earth today where recycling of crustal material takes place, and through geological time they have been the sites of continent formation. The principal objective of Leg 185 was to core two sites in Mesozoic crust in the west Pacific, which is being subducted into the Mariana and Izu-Bonin subduction systems, in order to determine the inputs into the "west Pacific subduction factory." Hole 801C was first drilled in the oldest (~165 Ma) crust in the Pacific Ocean during Leg 129. During Leg 185 the hole was deepened to nearly 500 meters below seafloor. Located on magnetic Anomaly M11 (~132 Ma) 100 km east of the Izu-Bonin Trench, the entire sedimentary sequence (410 m) and an additional 133 m of highly altered volcanic basement was drilled at Site 1149.

Seven volcanic sequences were defined at the Mariana site (801) using core and the logging results. The uppermost unit is a series of alkali basalts, dated at ~155 Ma that are separated from the underlying normal oceanic crust by a Si-Fe-rich hydrothermal deposit. In contrast, the Izu-Bonin site (1149) basement is dramatically different in character. It is pervasively altered at low temperatures to red dusky brown and preserves multicolored halos around veins and fractures. Thin flows, hyaloclastite, and flow breccia dominate the volcanic facies.

The subducted trench sediments partly control geochemical differences in the composition of arc magmas. Both the Mariana and Izu-Bonin margins are characterized by complete subduction of the sedimentary section on the downgoing plate, thus simplifying the dynamics of the subduction problem. Although the subducting sediments are reasonably well sampled in the Pigafetta Basin (Mariana region), earlier drilling attempts to recover the sedimentary section seaward of the Izu-Bonin Trench, had been thwarted by difficult drilling conditions. Thus, an important objective of Leg 185 was met by continuously coring and logging the ~400 m sedimentary section at Site 1149. This sequence proved to be substantially different from that being subducted at the Mariana Trench, which may explain some of the geochemical differences between the two arc systems.

Leg 185 was the first ODP leg to conduct a series of in-hole contamination tests while undertaking a systematic study of the **deep biosphere** in oceanic sediments and basement. These tests involved adding highly sensitive tracers (i.e., perfluorocarbons and fluorescent microspheres) to the drilling fluids and the core barrel to evaluate the extent of contamination of the cores by microbes introduced during the drilling process. Results of the tests revealed that the centers of advanced hydraulic piston corer (APC) cores are essentially uncontaminated during coring, whereas rotary core barrel (RCB) cores in sediment and basement contain variable amounts of introduced tracer. In addition, samples of sediments and basalts were placed in cultures aboard ship for shore-based study. Possible microbial tracks observed in 170-Ma volcanic glass are intriguing evidence for a deep biosphere still active at the extreme depths (>930 mbsf) sampled during Leg 185.

Leg 186 West Pacific Seismic Network

Two borehole geophysical observatories were installed ~1100 m below the seafloor on the deep-sea terrace of the Japan Trench during Leg 186. Site 1150 and Site 1151 are located in areas with contrasting seismic characteristics. The northern site is within a seismically active zone where microearthquakes are frequent and M7 earthquakes recur. The southern site is within an aseismic zone where no earthquakes are observed. These features coexist within the seismogenic zone of the Japan Trench plate subduction zone, where the Pacific plate is subducting at a fast rate (~8 cm/yr.) beneath northern Japan causing major. Such a dynamic nature of the subduction seismogenic zone remains unexplained because no geodetic and few seismic stations exist on the seafloor in the vicinity of the fault (décollement) zone. Leg 186 is the first scientific venture to succeed in installing state-of-the-art strain, tilt, and seismic sensors for long-term operation in seafloor boreholes. The borehole instruments were installed only 10 km above the gently dipping (< 5°) plate boundary. The systems started collecting data in September 1999 and will be serviced by a remotely operated vehicle (ROV) at least once a year to recover continuous high sampling rate and wide dynamic range data. These stations are critical additions to the existing geophysical network over the western Pacific. The JOIDES Resolution can now emplace this type of multiple-sensor seismo-geodetic observatory at many other areas where active processes await to be monitored.

Recovering detailed ash records was another of the drilling objectives. As with previous drilling results, a general increase from ~9 Ma and a peak in the past 0.5-4 Ma is observed at the two sites. Post cruise studies will examine the details of the ash record, which was more completely recovered on Leg 186 than on previous cruises. Logs were runs were performed at Site 1151 to characterize the hole conditions and geophysical characteristics of the observatory locations. The FMS images show that both the hole condition and the log data quality are exceptionally good. Inorganic geochemical analysis confirmed that a large decrease in chlorinity and salinity with depth exists in the Japan Trench region. The character of the anomalies varies also between the two sites. Overall, the magnitude of decrease seems much larger than other subduction environments such as at Nankai or Barbados.

Leg 187 Investigating the Australian-Antarctic Discordance

The Australian-Antarctic Discordance (AAD) is an anomalously deep region centered on the Southeast Indian Ridge (SEIR) between Australia and Antarctica. Among its unique features is an unusually sharp boundary between the ocean-basin scale upper mantle isotopic domains of the Pacific and Indian Oceans. This boundary has migrated westward into and across the easternmost segment of the AAD at a rate of 25-40 mm/yr during the last 4 m.y., yet the long-term relationship of this important boundary to the AAD remains unclear. There is limited evidence to suggest that the boundary has been migrating westward for ~40 m.y., since the separation of the South Tasman Rise from Antarctica. However, it seems likely, perhaps even probable, that the isotopic boundary is genetically linked to the mantle processes that have maintained the existence of the AAD for >90 m.y., since Australia and Antarctica first rifted apart.

The long-term configuration and dynamic history of the isotopic boundary will be determined using the Leg 187 systematic off-axis drilling results. Leg 187 drilling extended the off-axis sampling beyond conventional dredge operations to older crust, 10-30 Ma. An array of 19 drill sites were designed to determine the configuration of the isotopic boundary and to distinguish among competing hypotheses concerning the nature and extent of mantle migration beneath the SEIR. Holes sampled the upper 10 to 50 m into igneous basement using a reactive drilling strategy that allowed for the selection of new sites within a few hours of core recovery based on the trace element data obtained from earlier sites. This strategy was highly successful and Leg 187 ended in Fremantle on January 10, 2000.

FACILITIES AND TECHNOLOGY

Dry Dock

The *JOIDES Resolution* arrived at the Keppel Shipyard, Singapore, on September 1, 1999 following a transit from Yokohama, and departed October 28 for sea trials and transit to Fremantle for the beginning of Leg 187. The length of the dry dock period was 57 days, longer than originally scheduled. The goal of the dry dock was to maintain and improve the safe and efficient working environment of the JR and upgrade the ship's capabilities drilling to better achieve the objectives set out in ODP's LRP.

Dry dock maintenance and safety projects included:

- refurbishment to the ship's hull, thrusters, thruster wells, tanks, propulsion gear box, rudder;
- renewal of the salt water/bilge system;
- replacement of all sanitary piping within the accommodations;
- replacement of the crane booms;
- and the drilling equipment was stripped down and inspected.

Dry dock upgrades included:

- a new data management system (DMS) for ship's power systems;
- a synchronous condenser to reduce maintenance of equipment and increase fuel savings;
- a new automatic station keeping (ASK) system that provides a dual redundancy for maintaining station under a greater range of environmental conditions;
- the addition of a new floor on the lab stack for permanent installation of a microbiology laboratory, a new down hole measurements laboratory (DHML), a new conference room for the scientific party, and a core loading platform;
- the main core laboratory was renovated to improve core flow and analyses;
- a new breathing system was installed in the core lab, the core handling catwalk and the drill floor to facilitate safe handling of H2S laden cores; and
- a new Schlumberger data acquisition unit (MCM).

Overall, the *JOIDES Resolution* is a much more capable vessel with extended water depth capabilities, improved operational efficiency, and the capability to routinely conduct microbiology and gas hydrate research.

This dry dock was the largest project taken on by the Program since the ship was converted for ODP operations 16 years ago. Most of the projects were completed and commissioned before the ship arrived in Fremantle to begin Leg 187. Some outstanding tasks remain:

- acceptance of the ASK in shallow water conditions;
- additional steel work, identified by ABS inspection in Singapore, is necessary and repairs are planned during the Leg 188 port call;
- refurbishment of two more generators;
- final commissioning of the synchronous condenser on two engines;
- refurbishment of some areas of the living quarter that were damaged at the shipyard; and
- installation of the cabinets and benches and laying the flooring material in the DHML.

Active Heave Compensation (AHC) System

During the dry dock period, ODP/TAMU took this opportunity to install the active heave compensation (AHC) system, a project originally planned for FY97-98. Active heave will more efficiently de-couple ship's heave from the drill string. With reduced heave, variability in weight-on-bit can also be reduced. It is well known that good control of weight-on-bit results in enhanced core quality, longer bit life and greater control when landing equipment on the bottom or in the hole. Complementary to the AHC, a rig instrumentation system, FUSION, was installed that allows for drilling parameters to be displayed and recorded in real time. The installation of the AHC is was not completed during dry dock. Completion of the AHC installation, shake-down and commissioning is planned for Leg 188. Low friction seals were installed in the passive drill string compensators. The installation of low friction seals will enhance the performance of the new active compensation system. Moreover, the low friction seals will improve the responsiveness of the passive system if, for some reason, the AHC system is not operating. The low friction seals were installed in dry dock and reports indicate they performed well during Leg 187.

Deployment of the Drill String Acceleration Tool (DSA) and the Anadrill Measurement-While-Drilling (MWD) were originally scheduled for Leg 186E to test the performance of the ASK. ODP/LDEO rescheduled the MWD tests for Leg 188. The MWD equipment will be deployed in two holes during Leg 188 to directly measure weight-on-bit with and without the ASK operating. A testing plan is being coordinated among LDEO, TAMU, and Anadrill. Uphole and downhole weight-on-bit will be compared by LDEO during the leg and TAMU will study the response and behavior of the FUSION and Anadrill rig floor instrumentation systems. The DSA and the LDEO pilot sensor are now scheduled to be deployed on Leg 191.

Laboratory Improvements

A JY2000 ICP (Inductively Coupled Plasma Analyzer) was purchased in July by the U.S. Department of Energy and made available to ODP. ICP allows rapid and accurate analysis of the elemental composition of both solids and fluids, thus effectively replacing both the atomic absorption analyzer and the X-ray fluorescence instrument. The instrument arrived at ODP/TAMU from France in mid September. It was temporarily set up in the lab at ODP/TAMU and both Rick Murray, of Boston University, and JY technical representatives conducted training sessions for ODP technical support staff and staff scientists. The instrument was then shipped to Fremantle and installed in the chemistry lab at the beginning of Leg 187. The instrument worked well during Leg 187.

The temporary van used for microbiology on Leg 185 was removed from the ship during dry dock. The lab equipment was moved to the permanent lab space. Initially this is located in the

new top level on the lab stack, but it may be more efficient to locate microbiology activities on the same level as chemistry.

Hard Rock Reentry System (HRRS)

The HRRS is designed to initiate a hole on sloping hard rock, deepen the hole while stabilizing the upper part of the hole with casing and withdraw the bit through the casing string, leaving behind a funnel for future re-entry. The HRRS was tested on Leg 179 and it performed satisfactorily, but the bits failed prematurely due to severe sea states. The HRRS system and newly designed bits were originally scheduled for testing during Leg 186E. Plans are now in place to test the HRRS during Leg 191. In preparation for sea trials, redesigned bits were quarry-tested in the fall of 1999 and a final quarry bit test is scheduled for late January 2000. If the quarry tests are successful, bits will be ordered and the hydraulic hammer equipment will be mobilized for sea trials in August 2000.

Advanced Diamond Core Barrel (ADCB)

The Advanced Diamond Core Barrel (ADCB) is a joint technology development initiative with JAMSTEC with a goal to develop a thin kerf diamond coring system for improved core quality, hole stability and core recovery. Improved hole stability results in a cleaner hole that reduces the risk of sticking and improves logging. The initiative was structured as a three phase program: Phase 1 - design and fabrication of ADCB prototype core barrels and cutting shoes; Phase 2 - bench and quarry testing of equipment; Phase 3 - sea trials. Phases 1 and 2 were completed and the ADCB is ready to be field-tested. In addition, during the summer and fall of 1999, ODP worked with vendors to develop a shock sub tool and a circulation tool. Both systems are designed to enhance the performance of the ADCB and will be available for sea trials. Sea trials for the ADCB have not been definitely scheduled, but Leg 191, 192 or 193 are all good candidates if several days of engineering time can be made available.

Seismic Data Integration

ODP/LDEO secured a license for GeoQuest's IESX package (as per the SciMP recommendation). IESX is a seismic processing and analysis software that sits within the GeoFrame system and may provide improved seismic data integration and synthetic seismogram production for ODP.

DATA AND PUBLICATIONS

Database

The final version of the Janus visual core description software, from AppleCORE, was delivered to ODP/TAMU in November. The software was deployed on Leg 187 for testing purposes. Incorporation of the software into the Janus database system is expected to continue throughout 2000.

During the last few months of 1999, an ODP committee met to review the Janus applications and the ODP-programmed applications that are supported by the programming group of ODP/ISD. The objectives of the committee were to identify those tasks required to "complete" all Janus applications and to set the work priorities for their completion. The results of the committee's efforts will be published in January and full implementation of the committee's recommendations is ongoing.

Data were migrated for Legs 162 and 163. The cumulative effort is now migration of data from Leg 162 through Leg 170. Progress on data migration was slowed when the staff member responsible for this activity left ODP in early fall. Continued progress during this year is expected to accelerate when the vacant data migration position is filled in March of this year.

The ODP Log Database has been updated through Leg 186, including Schlumberger original and processed data (conventional, geochemical, and FMS), specialty tools (borehole televiewer, multichannel sonic, and temperature), borehole images, and sonic waveforms. Leg 134 and Leg 154 GHMT data were processed at the LMF processing center for inclusion in the on-line database. GHMT plots were made available through the on-line database. These plots had not previously been included in the on-line database. Sonic waveform data from 95 holes have been checked for inclusion in the online database. The data are in ASCII format. Future legs will be in binary format. The entire inventory of processed standard logs is being copied from 9-track to DAT tapes. The transfer will be completed shortly. The transfer of the entire inventory of processed geochemical data was completed in November.

The on-line ODP Log Database was updated to do a logical AND search to provide increased flexibility to the user interface.

Distribution

From July through December 1999, the following ODP Proceedings volumes were produced and distributed:

Initial Reports Booklet/CD-ROM (PDF version): 178, 179, 180, 181
Scientific Results Booklet/CD-ROM (PDF version): 163, 164

Leg 180 and 181 CD-ROMS were completed and sent to Freisen Printers, to be included in the Leg 181 Initial Reports publication. The Leg 180 CD was not included in the Leg 180 *Initial Reports* volume due to delays in the production of this CD.

Beginning with Leg 160, authors were permitted to fulfill their ODP publication obligation by either submitting a manuscript to a peer-reviewed journal that is published in English, or by submitting a paper or data report to the SR volume. The Department tracks authors who do not meet their obligations and the Senior Publications Coordinator reports this information directly to JOI.

Between June and November 1999, 6 institutions in 3 countries were sent 717 ODP and 370 DSDP volumes (China–821, Columbia–205, U.S.A.–61). In response to SCIMP recommendation 99-1-10 (SR Synthesis Papers), in May 1999, the new policy guidelines were sent to co-chiefs reminding them of their responsibility to write or coordinate a leg-synthesis paper to be published in the *Scientific Results* volume. Between June and December

1999, co-chiefs committed to writing leg-synthesis papers for Legs 170, 171A/B, and 174B and leg-synopsis papers for Legs 169, 172, 173, and 174A/AX. Starting with Leg 175, all co-chiefs are required to provide a leg-synthesis paper for each SR volume.

Electronic Publications

During the second half of 1999, the Publication Services Department continued to work on the development of the new formats for the *Scientific Results* (SR) volume booklet/CD-ROM product and designed an HTML SR format for the WWW. Beginning with *Scientific Results* Volume 169, all SR papers will be published on the WWW in both HTML and PDF formats. The goal is to provide leg participants with the opportunity of publishing ODP post-cruise research papers as quickly as possible (between one and four year's post-cruise) on the WWW. Four years post-cruise the papers will be reprinted on CD-ROM in PDF format and distributed with the SR booklet containing the leg synthesis paper.

Electronic publications included:
WWW (PDF and HTML versions): 178, 179, 174AX Suppl., 180
WWW (PDF and HTML versions): 162, 163, individual papers from 169

Beginning with Legs 176 and 162, all *Initial Reports* and *Scientific Results* chapters are published on the WWW in PDF and HTML formats. The Department is tracking Web traffic to all ODP publications.

Mirror Sites

The initial goal was to mirror, at a minimum, the entire ODP/TAMU WWW site except for the Janus material at institutions in other member countries. To date, only the Australian Geological Survey (Australia) has completed efforts to establish a mirror site (http://www.agso.gov.au/odp). Two other mirror sites, the Natural History Museum (London, UK) and Universität Bremen (Bremen, Germany), are still working on the development of their sites. These two sites should be functioning in 2000.

Publications/Citations

In response to a recognized need to track ODP-related citations, ODP/TAMU has purchased a database of citations to papers published on DSDP/ODP-related research that was compiled by the American Geological Institute. The database (drawn from the full American Geological Institute GeoRef database) contains an estimated 12,500 references to Program-related publications produced since 1969. The data will be used to help identify and chart the impact of the Ocean Drilling Program activities on geoscience research.

General Publications and Presentations

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Amend Terms of Reference

SCICOM Motion 99-2-16
SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

JOIDES EXECUTIVE COMMITTEE MEETING

THE RENAISSANCE SYDNEY HOTEL
SYDNEY, NEW SOUTH WALES, AUSTRALIA

29–30 JUNE 1999

Executive Committee – EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Maria C. Comas	Universidad de Granada, European Science Foundation (ECOD)
Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
Robert Detrick	Woods Hole Oceanographic Institution, USA
David Feary	Australian Geological Survey Organisation, PacRim Consortium
Chris Harrison	Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, USA
Margaret Leinen	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
Mrinal Sen*	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan
Brian Taylor	School of Ocean and Earth Science and Technology, University of Hawaii, USA

*Alternate for Paul Stoffa

Associate Member Observers

Catherine Mével	Université Pierre et Marie Curie, Paris, France
Zhixiong Wang	Marine High Technology Bureau, Beijing, China

EXCOM Liaisons

Kathryn Moran	Joint Oceanographic Institutions, Inc.
Jeff Fox	Science Operator (ODP-TAMU)
David Goldberg	Wireline Logging Services (ODP-LDEO)
Donald Heinrichs	National Science Foundation, USA
William W. Hay	SCICOM Chair, JOIDES Office, GEOMAR Research Center, Germany

Guests and Observers

J. Paul Dauphin	National Science Foundation, USA
John Farrell	Joint Oceanographic Institutions, Inc.
Masaya Fukuhama	Science and Technology Agency, Japan
Mikihiro Kato	MONBUSHO, Japan
Dennis Kent	Rutgers University, USA
Hajimu Kinoshita	JAMSTEC, Japan
Tom Loutit	SRK Consulting, Australia (PEC-V Member)
Bruce Malfait	National Science Foundation, USA
Dietrich Maronde	Deutsche Forschungsgemeinschaft, Germany
Ted Moore	IPSC Chair, University of Michigan, USA
Michael Purdy	National Science Foundation, USA
Takeo Tanaka	JAMSTEC, Japan
Michael Tricker	NERC, United Kingdom
Shigehito Uetake	JAMSTEC, Japan
Philippe Vidal	CNRS, Paris, France

JOIDES Office

Jeff Schuffert	U. S. Liaison

JOIDES EXECUTIVE COMMITTEE MEETING

AT

THE RENAISSANCE SYDNEY HOTEL
SYDNEY, NEW SOUTH WALES, AUSTRALIA

29–30 JUNE 1999

DRAFT MOTIONS

EXCOM Motion 99-2-1

EXCOM approves the agenda of its June 1999 meeting.

Harrison moved, Detrick seconded; 15 in favor.

EXCOM Motion 99-2-2

EXCOM approves the minutes of its January 1999 meeting.

Orcutt moved, Prior seconded; 13 in favor, 2 abstained (Sen, Taylor).

EXCOM Motion 99-2-3

EXCOM congratulates the organizers of COMPLEX for an exciting and highly successful conference at the University of British Columbia. COMPLEX clarified the exceedingly important future role that ocean drilling will play in understanding earth processes. EXCOM would like to give special thanks to Kate Moran and JOI for the logistical arrangements that allowed the conference to proceed so effectively, and to Nick Pisias, Asahiko Taira and the rest of the steering committee for encouraging such good discussion of innovative science.

Orcutt moved, Harrison seconded; 14 in favor, 1 abstained (Taira).

EXCOM Consensus 99-1-4

EXCOM endorses the IPSC plan to form working groups for science planning, industry liaisons, and technology.

EXCOM Consensus 99-1-5

EXCOM recommends that IPSC recruit working groups for industry liaisons and technology with care taken to avoid possible conflicts of interest.

EXCOM Consensus 99-1-6

EXCOM recommends that IPSC recruit a working group for science planning in consultation with SCICOM, while considering the concerns of EXCOM about the breadth of experience and knowledge of the members as well as potential conflicts of interest.

EXCOM Consensus 99-1-7

EXCOM endorses the review process proposed by IPSC regarding development of a new long-range plan by the working group for science planning.

EXCOM Consensus 99-2-8

EXCOM establishes a subcommittee to identify better options for integrating ODP with other scientific drilling programs. This group should prepare a concept document and present it to EXCOM at their next meeting. The subcommittee will consist of Taylor (Chair), Mutter, Orcutt, and Beiersdorf (*ex officio*).

EXCOM Motion 99-2-9

EXCOM revises the Terms of Reference for Program Planning Groups, as requested by SCICOM. See SCICOM Motion 99-1-7.

Orcutt moved, Harrison seconded; 14 in favor, 1 abstained (Briden).

EXCOM Motion 99-2-10

EXCOM approves the FY 2000 program plan.

Nowell moved, Detrick seconded; 13 in favor, 2 abstained (Mutter, Prior).

EXCOM Motion 99-2-11

EXCOM approves the membership status of ECOD and PacRim.

Leinen moved, Taira seconded; 12 in favor, 2 abstained (Feary, Comas), 1 absent (Orcutt).

EXCOM Motion 99-2-12

As we sit within singing range of the Sydney Opera House, the Three Tenors come to mind. In ODP we have an equivalent in the Three D's, Don Heinrichs, Dietrich Maronde, and David Feary. EXCOM expresses immense gratitude to these three persons who have provided leadership to the Ocean Drilling Program, to EXCOM, and to the ODP Council. We can hardly remember ODP before Don. He has served as the keystone of the ODP structure for almost its entire existence. We thank Don for his leadership and patience in dealing with the advisory structure. And to Dietrich Maronde who has been an enthusiastic supporter and stalwart advocate of ODP for as long as Hans Dürbaum, former EXCOM member from Germany. You will soon join Hans in retirement—perhaps we will see you on PEC-VI. And we thank David Feary for his resolute effort to keep PacRim as a full member and for his hard work to make this meeting so enjoyable. We look forward to seeing him in Washington, D. C.

Approved by acclamation.

JOIDES EXECUTIVE COMMITTEE MEETING

THE RENAISSANCE SYDNEY HOTEL
SYDNEY, NEW SOUTH WALES, AUSTRALIA

29–30 JUNE 1999

DRAFT MINUTES

1. Welcome & Introduction

Helmut Beiersdorf called the meeting to order promptly at 0900 hrs and the attendees introduced themselves. David Feary explained the meeting logistics and introduced his assistant, David Ewyk of the Australian Geological Survey Organisation.

2. Approval of Agenda

Beiersdorf proposed two minor changes to the agenda: Item 9.1 moved ahead to precede Item 4 and Item 6.3 moved down to follow Item 6.7. No one else commented on the agenda.

EXCOM Motion 99-2-1
EXCOM approves the agenda of its June 1999 meeting.

Harrison moved, Detrick seconded; 15 in favor.

3. Minutes and Matters Arising

EXCOM Motion 99-2-2
EXCOM approves the minutes of its January 1999 meeting.

Orcutt moved, Prior seconded; 13 in favor, 2 abstained (Sen, Taylor).

Selected ODP achievements

Bill Hay gave a brief presentation on recent noteworthy scientific achievements related to ODP. He referred initially to general evidence for alternating warm and cool modes of climate over the last 600 MY, then he noted a particularly exciting new paper by Pagani *et al.* that had just appeared in *Paleoceanography*. This paper on Miocene CO_2 levels relied directly on samples from several DSDP and ODP sites, and it argued that ocean circulation exerted more control on climate over long time scales than CO_2 and silicate weathering. Hay also mentioned that a very favorable review of this paper had just appeared in *Nature*.

Brian Taylor asked if Hay intended with this presentation to emphasize the legacy of the ODP core collection and database. Hay answered yes and pointed out that the analytical techniques used in this study did not yet exist when the cores were collected.

4. NSF/ODP Council Reports

Don Heinrichs delivered the NSF management and ODP council reports. He explained that NSF had provided JOI with a target budget of $46.1 M for FY 2000. This includeed a modest increase from NSF funds. ECOD and PACRIM remained slightly short of full membership. France had signed an MOU to participate as an associate member (2/3 level) for the remainder of the program,

and the People's Republic of China remained an associate member (1/6 level). Heinrichs noted that other items in the management report fell elsewhere on the agenda.

Heinrichs outlined the agenda for the ODP Council meeting that would immediately follow this meeting. In addition to the usual reports, the Council meeting would include an open discussion of membership issues and a closed session to audit or review the organizational funds. After noting that the NSF personnel structure had remained stable with regard to ODP over the last several years, Heinrichs announced that he would retire at the end of this year and that Bruce Malfait would head the ODP Council and serve as the NSF liaison to EXCOM.

Beiersdorf thanked Heinrichs for his report and said that EXCOM would miss him.

5. Country Reports

5.1 ECOD

Menchu Comas reported that ECOD now had only eleven member countries, but they hope to get Turkey back on board, and efforts to recruit Ireland continue. EMCO held several meetings to discuss future planning for post-2003 and explored the possibility of France joining ECOD. A workshop was held in Grenada one week ago to discuss drilling in the Mediterranean, and another workshop would occur this fall in Amsterdam to discuss post-2003 drilling initiatives.

5.2 France

Catherine Mével reported that Phillipe Vidal attended a joint EU/ESF meeting in Brussels in March to discuss executive level coordination of European participation in scientific drilling, and John Ludden met with the ECOD Management Committee in March to talk about future partnership.

5.3 Germany

Dietrich Maronde reported that DFG had accepted 58 proposals for ODP-related funding in FY`99, totaling about 5.5M DM. These figures could appear misleading, however, because DFG project funding covered the period from July 1 – June 30. Germany's annual contribution to ODP stood at $2.95M. DFG was trying to be as flexible as possible in funding ODP-related research projects. The DFG board of governors had written a letter of intent to IWG regarding the future program. Progress continued in the ICDP program with respect to various European meetings as already mentioned in other reports. Germany remained optimistic about science budgets, but had to recognize the current weakness of the Euro currency and possible expenses related to the war in Kosovo.

5.4 Japan

Asahiko Taira reported on the Yokohama portcall following Leg 185. The portcall activities received widespread media coverage in newspapers and on television. A total of 151 VIPs, including five members of the Diet, visited the ship and attended an evening reception. An open house the next day drew 1353 visitors to the ship, a single-day record. Over 100 volunteers assisted with the open house.

Beiersdorf congratulated Japan for the successful portcall and good public relations.

5.5 Pacific Rim Consortium

David Feary reported that Korea continued to increase its involvement and had instituted a program for shore-based support. Canada showed strong commitment after a previous slack period, and they expected soon to submit a letter of intent for the future program. Australia would most likely delay in submitting a letter of intent for post-2003 because of current restructuring and a change in representatives. AGSO had experienced a 20% cut in staff with some impact on ODP activities, but they would continue to support ODP through the end of the current program. On the personnel front, Feary noted that Neville Exon would replace him, Trevor Powell would replace Chris Pigram, and Canada would supply the EXCOM representative as of next January. In examining the issue of how to satisfy the requirements of full membership, PacRim had recently decided to increase the contribution of all current members rather than recruit a new member. Unfortunately, Chinese Taipei subsequently announced that they would reduce their input from a 1/6 to a 1/12 member.

5.6 The People's Republic of China

Zhixiong Wang reported on the success of Leg 184 in the South China Sea, the Hong Kong portcall following that leg, and initial post-cruise activities of Chinese scientists. Wang finished by saying that Chinese scientists looked forward to ocean drilling in the new century and hoped to contribute.

Beiersdorf thought this represented a good example of how portcalls could have a strong positive effect on scientific activity within even a large country such as China.

5.7 UK

Jim Briden reported that the U.K. had recently awarded several large ODP special topics grants for paleoclimate and paleoceanography studies. He mentioned the success of the industry/academic forum held at the Sunbury offices of BP-Amoco in March and noted that he would discuss the outcome later in this meeting. NERC expected to get final approval soon for the LINK margins program, a research initiative for co-funded work with industry partners.

Briden announced that NERC had submitted a letter of intent for IODP, signaling that the U.K. would like to become a substantive member of IWG and have significant involvement in IPSC planning activities. Briden also informed the committee that Professor John Krebs would retire from his position as Chief Executive of NERC effective 30 September 1999. Professor John Lawton from London University will succeed Krebs at NERC, and Michael Tricker will represent NERC at this ODP Council meeting and until further notice.

Bob Detrick said that he felt pleased to hear this report, especially considering the limited U.K. participation at COMPLEX. Briden replied that the U.K. sent 10-15 scientists to COMPLEX, but they had difficulty getting more people to go because of a time conflict with the final exam period. He emphasized that it was not a budgetary problem.

5.8 USA

Don Heinrichs reported that NSF did not know its final budget until March, or halfway through the fiscal year. Last year's budget increased about 8% overall, mostly in science projects, while facilities funding remained constant. The MARGINS program, led by Brian Taylor, received substantial support. NSF had started planning the ODP budget through 2006, which would include

the phase-out of the old program and spin-up of the new one. Heinrichs also noted that the author of the paper discussed earlier by Hay was a USSAC fellow.

Kate Moran noted that the very first undergraduate student trainee was now onboard the ship and supported by the USSSP. She also reported that USSAC had established a conceptual design committee (CDC) for a second drilling platform, based on the outcome from COMPLEX. John Farrell listed the CDC members as Peggy Delaney (chair), Tim Byrne (USSAC), Steve Clemens (ESSEP), Susan Humphris (SCICOM), Tom Janacek (SciMP Chair), Roger Ingersoll (Mobil), Brian Taylor (consultant), and Jamie Austin (liaison from IPSC).

David Prior inquired about the nature and timing of CDC deliberations and the distribution of their final report, and Beiersdorf questioned whether the international community would have input to the CDC. Malfait noted that NSF had asked the CDC to focus on a non-riser type drill ship, and Moran emphasized that funds for the CDC would come from the U.S. alone. Heinrichs stated that the U.S. had made it clear for several years that it would commit to developing a second platform, but he added that the CDC would not remain a closed-shop operation indefinitely. Beiersdorf requested that the CDC at least circulate its reports to the international community. Moran asked to delay further discussion of this issue until the IODP planning portion of the agenda.

6. Management and Operations Reports

6.1 Update on industry and other partnerships

Kate Moran reported that DOE would contribute $70K toward a new shipboard laboratory for microbiology and gas hydrate research. Other industry technology projects underway included the advanced diamond core barrel (ADCB) project with JAMSTEC ($350K), the HYACE pressure sampling tool with European industry and academia, and the CONOCO deep-water site investigations project for using APC technology to obtain the geotechnical information needed for placement of production facilities. Moran noted that industry collaborations on science issues had proved harder to establish than those on technology. John Armentrout was planning another Houston workshop to bring together industry and academic scientists, but EGI had put the South Atlantic database migration on hold because of uncertainties over lease sales off Brazil. JOI planned to discuss industry partnership efforts at a September meeting with representatives of the various ODP member offices.

John Mutter could see how CONOCO would benefit from learning how to get shallow cores, but he wondered how ODP would benefit. Moran replied that ODP would benefit primarily from the availability of core material, but we'd also need financial support. Mutter thought the outlook for industry/academia collaborations seemed more optimistic than the picture just presented. Moran said she didn't mean to give that impression, only that collaboration occurs much more easily from the technology standpoint. Loutit commented that oil prices had in fact risen to favorable levels, but industry budgets remained uncertain for the future. Briden added that BP-Amoco had a strong interest in forming academic partnerships.

6.2 International efforts

Kate Moran reported that efforts to recruit India would continue, with Shiri Srivistava planning to visit Goa and ONG. Brazil could not join now, and JOI was investigating the possibility of Russia joining as an associate member.

Briden asked what Russian institutions were involved. Heinrichs mentioned that the Institute of Lithosphere had expressed interest, but unfortunately this was not a strong institute within Russia, and he explained that it previously was a matter of pride for Russia to join as a full member instead of at the associate level. Heinrichs also noted that a group from St. Petersburg had attended COMPLEX.

6.3 Public Affairs Report

Kate Moran reported on recent public affairs efforts, noting that the Hong Kong and Yokohama portcalls had already been discussed in other reports. The updated ODP website was now online, ODP media press kits were now available, and a new press release procedure, adopted in response to criticism from the recent co-chiefs review, seemed successful.

Taylor noted that Legs 180 and 184 had real-time daily updates from the ship and wondered whether any plans had developed for more of this on a regular basis. Moran responded that they were looking into this but had not figured out how to do it yet. Beiersdorf called for another update at the February meeting.

6.4 Update on microbiology lab

Kate Moran reported on the progress of the new microbiology lab and the success of initial tests on Leg 185. The laboratory van was installed and worked well, and the microbiologists were very happy with it. Tracer experiments revealed minimal contamination when using APC and some contamination with RCB. ODP/TAMU hoped to convert the van for radiotracer studies after adding the new level to the lab stack. A summary article by Rick Murray would appear in the next JOI/USSAC newsletter.

6.5 Update on drydock

Jeff Fox gave an update on scheduled drydock activities. He briefly explained the process for selecting a shipyard and announced that Keppel FELS of Singapore had received the contract. NSF would contribute $6M toward drydock activities, and ODL would pick up the excess costs, anticipated to reach $300K. Major drydock activities would include an upgrade of the dynamic positioning and data management systems, installation of an active heave compensator, and addition of a new level to the lab stack. The lab stack modification would address long-term needs for enhanced downhole tool capabilities, a microbiology laboratory, and better conference space for the scientific staff. It would also improve the safety and manpower requirements for storing and offloading cores. Now that ODP had identified the shipyard and logistical needs, they felt ready to move forward with drydock activities.

6.6 Y2K compliance of shipboard and shore-based computer networks

Compliant: JOI/TAMU financial accounting, JANUS.
Non-compliant: TAMU shipboard e-mail, LDEO VAX system.

Detrick asked about shipboard systems like dynamic positioning. Fox responded that Schlumberger had been very proactive in this regard.

6.7 Status of PEC-V program review

Kate Moran outlined the structure and membership of PEC-V and asked Tom Loutit, a PEC-V member, to give an update on the current status of the review.

Loutit explained that he could not yet give a formal report because the review was still in progress, but he could at least offer his own preliminary insight. He described the review committee as a diverse group, without any recent involvement in the program. They noted first that the program had instituted many changes in the last few years, mostly for the good, though of course they saw lots of room for improvement, and any improvements made now could carry forward to post-2003. Their biggest concern was the transition and planning process. It looked like many groups were sitting around waiting for NSF to do something, and that was not the right approach. Things had started to happen, but it looked like the community had not yet clearly communicated the overall game plan or perhaps had not completely defined it in the aftermath of COMPLEX. PEC-V had also tried to determine how well the new advisory structure was working by meeting with various components, and they received over 80 responses to a questionnaire distributed at COMPLEX. Loutit said that concern existed across the community about a perceived gap between EXCOM and the rest of the advisory structure, particularly SCICOM. Helmut Beiersdorf had suggested holding a joint EXCOM/SCICOM meeting, although others had suggested that too many guests and liaisons already attended certain meetings.

Briden expressed surprise at the comment about the advisory structure. Loutit responded that PEC-V would evaluate how well the advisory structure had followed the Long Range Plan, and he added that the new LRP for the future program looked pretty generic right now. Loutit also expressed pleasure in the report given earlier that morning by Hay in an effort to generate excitement about current science topics. Beiersdorf said that he had also heard from various sources that EXCOM was too far removed from science, and perhaps we could improve this by having a joint meeting.

7. Other Partnerships

7.1 ICDP

John Mutter said that he did not have much to update on ICDP since the last EXCOM meeting and turned the floor over to Brian Taylor, who had attended the recent DOSECC meeting in Hawaii. Taylor visited the borehole on Hawaii, where drilling proceeds at a fast rate and may reach a deeper objective than originally planned. He reported that good progress continues on a collaborative development of new drill-bit technology, as well as on a barge system with a containerized rig, transportable by helicopter, for drilling in remote lakes like those of the East African rift valley. Taylor thought that the potential for greater emphasis on alternate platforms such as these could allow for more future interactions around a common framework, especially considering that the thematic drivers for ICDP and IODP overlapped by perhaps 80% or more.

Fox noted that ODP/TAMU had loaned surplus equipment to DOSECC and had committed to lending engineering support at a 1/2 FTE level. John Orcutt mentioned that the NSF Earth Sciences group would seek funding this year for the SAFOD project to drill through the San Andreas Fault, but this had no connection with ICDP. Comas added that ICDP members were present when the Crete transect was discussed at the Grenada meeting last week. Hay noted that the SCICOM minutes contained a report from Ulrich Harms on ICDP. Hay also summarized the proposal input to ICDP and explained that they do not have an extensive proposal review mechanism like ours. He

stated that several current projects had a component in both ODP and ICDP (e.g., Ken Miller had a joint proposal in the system now, and Comas already mentioned the Crete proposal), but we have no formal way to discuss these joint ventures. Maronde said that he attended a recent ICDP meeting and heard a lot of discussion on how to cooperate between the two programs. He also noted that contrary to what appears in the SCICOM draft minutes, China participates as a partial member of ICDP and France does not.

Beiersdorf felt that ODP had shown more initiative in approaching ICDP than they had in approaching us, perhaps because we have a stronger organization. He thought both groups could benefit from a stronger link but wondered if it made sense to try to establish an integrated management structure at this stage. Mutter, who attends meetings of the ICDP council of governors, believed that the proper route to achieve joint planning objectives should happen at the SCICOM level. Mével agreed that the momentum should come from the science community rather than from the top down, and she suggested that perhaps we should set up PPGs with members from both groups. Mutter asked if NSF wished to link these programs more closely. Heinrichs confirmed that NSF would like to see a process to define better the linkage between these programs. He stressed the importance of integrating things on an intellectual level rather than a management level because NSF had concerns about a unified management structure and the flexibility of belonging to one group or the other. Beiersdorf suggested that EXCOM charge SCICOM with establishing a joint planning group and he asked Mutter and Taylor to craft a motion in this regard and present it later.

7.2 Industry

Jim Briden reported on recent developments in Europe and elsewhere, as described in an annex to the U.K. report. BP-Amoco sponsored a meeting at Sunbury this past spring with about 30 participants, many from high levels in academia and industry. Most of these people previously had no direct involvement in ODP, but they understood the importance of this meeting. They looked at areas of future interest where industry leads in capability and experience. The goals outlined in the meeting report mesh well with the outcome of COMPLEX and send a clear signal of enthusiasm from industry; however, a sense arose that ODP had spread itself too broadly and needed a better focus in the future. The meeting closed with several recommendations for the future, including a unified European involvement through EU mechanisms. The next European forum for ODP should involve academic and industry participation. Shell would sponsor another meeting in The Hague. In other news, Fugro had raised the possibility of timesharing a vessel in the early part of the next century. Briden stressed that we needed to articulate very clearly how industrial participation would promote European interests in the future, but we also had to assure that a purely European initiative would reinforce the broader goals of ODP mentioned earlier by Moran.

Beiersdorf said that that sounded very encouraging for the future and Germany would try to support that initiative. Next November Germany would present their future program plans to industry and try to educate them on our science mission and enlist their support. We need to avoid interference among industry groups and try to unite them as much as possible, and we need closely linked science and technology strategies. COMPLEX had a strong impact on the industry members of TEDCOM, and they had expressed a willingness to support such a strategy.

Mutter asked what tangible mechanisms we could optimistically foresee besides another meeting. Briden said it depends on what vessels we would eventually use and the associated technology issues. For example, we could use vessels of opportunity on individual projects. At the science

level the important thing was getting maximum involvement of people around the table. Beiersdorf noted that industry wants to drill fans, get high recovery and study diagenetic processes. Ted Moore asked what benefits the European community hoped to get from industry separately as opposed to our program as a whole. Briden explained that EU research funding goes exclusively toward applied science, such that the majority of academic funding depends on involvement with industry. No possibility existed under the current framework for an EU funded subscription or participation in the program. Tricker added that the U.K. government exerted pressure to show the relevance of science to economic competitiveness and the quality of life, so there was a political dimension to working with industry.

Beiersdorf suggested that the U.S., EU, Japanese, and other components of industry partnership must all have input flowing into IPSC. Taylor doubted that a purely U.S. component existed because of the international nature of most large corporations. Beiersdorf said that we still needed to make sure this would all come together in the new advisory structure. Moore agreed and predicted that IPSC would organize a working group to forge good partnerships. Taira said he would like to hear more about industry goals in the IODP part of this meeting.

8. IODP Planning

8.1 Status of OD21 Program

Asahiko Taira outlined the progress of the OD21 program since the last EXCOM meeting, noting that in March the government approved the initial budget increment for construction, JAMSTEC requested design input from SCICOM, and IWG delegated this task to IPSC. In April JAMSTEC started the initial basic design work, while the U.S. and Japan had added the OD21/IODP program to their Common Agenda for Cooperation in Global Perspective.

Takeo Tanaka outlined the schedule of ship construction and testing and also the proposed budget for FY`00. He explained that the latest plans for a larger riser drilling ship (48-49 thousand tons) included a 21" riser instead of a 16" riser, better motion characteristics, more-spacious shipboard laboratories, larger storage capacity, and adaptability to future technical innovations.

8.2 IWG

Beiersdorf summarized the previous IWG meeting, where topics of discussion included technological developments, the formation of IPSC, commitments to and operating costs of the new program, OD21 and the riser drilling ship, the U.S. role in providing a non-riser drilling ship, and the possibility of a hiatus between programs. Fox provided an update from ODP on several technology issues, and Kinoshita said that he had nothing new to report on the joint JAMSTEC/Scripps project. Tricker noted that dialog on funding from individual European members would continue.

Detrick asked for more information on the question of MOUs. Beiersdorf explained that it takes years to negotiate MOUs because it depends on knowing financial commitments. Michael Purdy said that the IWG would continue with the plan developed at Leiden in 1997 for a staged increase in formal commitment. Germany, the U.K., and the EU have so far submitted letters of intent to remain formal members of IWG, well ahead of the 1 October deadline. Several committee members then expressed confusion about the relative authority of the EU (Brussels) and ESF (Strasbourg) to make financial commitments. Heinrichs answered that the models for sharing membership costs remained quite vague.

Several committee members inquired about what the anticipated $120-130M annual budget would cover. Heinrichs replied that it would primarily cover the year-round operational costs for two ships. Chris Harrison recalled hearing a much higher budget estimate at the Houston workshop, but Feary noted that that estimate included the costs of site surveying and other expenditures. Heinrichs said that it was difficult to give a definite cost estimate now because we still did not know exactly what the ships would look like. Taylor asked whether funding would exist before the riser ship comes on line in 2006. Purdy responded that IWG currently hoped to begin in 2004, with a 4-5 year transition to a fully operational multi-platform program. He added that the IWG had a major task on its hands to figure this out, and the cost estimates could change dramatically as things proceeded.

Detrick asked whether IPSC was responsible for planning the transition between programs, and Prior wondered when EXCOM would see a timetable of who reports to whom, and when. Moore admitted that IPSC holds responsibility for planning the transition, but the question of timing remains unanswered. Heinrichs said that different groups would have different timelines, and it depends to a large extent on the letters of intent and MOUs. He also said that we need to have a clearer picture by 2001, or else we would have a significant hiatus; however, national funding structures just would not permit us to know any earlier. Certainly we must know before 2003. Detrick acknowledged this difficulty but said it still bothered the committee not to have a better sense of the timeline for making decisions. Prior noted that we apparently have different timelines for government, science, and technical capacity, and we have not heard anything yet about the latter two. Beiersdorf suggested deferring further discussion until after the IPSC report.

8.3 U.S./NSF

Heinrichs showed a timeline diagram of future planning activities and explained that NSF expects to put out an RFP at the end of 2001 to solicit bids on the prime contract for the new program. Fox asked when the last leg of science would end in 2003. Malfait said somewhat earlier than September 2003, and Heinrichs said that it might take 2-3 months to decommission the ship. After Fox noted that the ODP contract stipulates a 7-21 day decommissioning period, Heinrichs conceded that the last leg could end as late as 23 September. Fox asked whether NSF had a plan for the tail of ODP, for example with regard to core curation, publications, etc. Heinrichs stated that the new program would probably subsume those responsibilities, but the details remained unknown.

Moore expressed uncertainty about what ICOSOD would entail and explained that IPSC would not have a complete management plan until later. Briden feared that if the date of ICOSOD slipped too far into the future it would compromise the transition. Heinrichs said that NSF certainly understood this, but unfortunately they would not know which of several possible models for a new ship or other platforms would become reality until the competitive bid process. He also reiterated that NSF could not make binding budget decisions in 1999 for 2004. Japan had the firmest commitment in place for post-2003, but only since early this year. Mutter asked if NSF had set an objective to not have a hiatus. Heinrichs answered yes, ideally, but realistically we may have to use a year of operational money to capitalize the costs of outfitting a new ship. Purdy stressed the importance of distinguishing between a program hiatus and just a hiatus in drilling operations. He confirmed that NSF strived not to have a program hiatus, but a drilling hiatus looked likely if not certain.

8.4 COMPLEX report

Asahiko Taira outlined the results of COMPLEX, noting that 323 scientists participated, and he discussed a timeline for completion of the final report. He also presented a summary letter from Nick Pisias to EXCOM and commended JOI for its work to ensure the success of COMPLEX. Beiersdorf asked for a formal motion to that effect and commented that the COMPLEX report should provide a good basis for IPSC to move ahead.

EXCOM Motion 99-2-3

EXCOM congratulates the organizers of COMPLEX for an exciting and highly successful conference at the University of British Columbia. COMPLEX clarified the exceedingly important future role that ocean drilling will play in understanding earth processes. EXCOM would like to give special thanks to Kate Moran and JOI for the logistical arrangements that allowed the conference to proceed so effectively, and to Nick Pisias, Asahiko Taira and the rest of the steering committee for encouraging such good discussion of innovative science.

Orcutt moved, Harrison seconded; 14 in favor, 1 abstained (Taira).

8.5 IPSC activities

Ted Moore reported on the early progress of IPSC and presented the IPSC planning schedule through the end of 2003. He outlined a series of important tasks, including establishing a strong relationship with OD21, forging stronger relationships with industry, defining the non-riser drilling platforms, developing a new long-range science plan, and defining the advisory and management structures for a new multi-platform drilling program. IPSC also recommended establishing an international review committee for the new long-range science plan and approving a catchier name for the post-2003 program (e.g., ISIS rather than IODP).

Moore complimented SciMP for taking a proactive forward-looking stance on the new program, and he noted that OD21 had their own committee on shipboard laboratory needs. Moore referred to two end-member models for laboratory design, involving maximum versus minimum shipboard science. He noted that although IPSC agree d about the best approach, the rest of the community held diverse opinions.

Taylor noted that IPSC favored one end-member model for staffing the ship, whereas the Houston Workshop report favored the opposite end-member. According to Moran, however, the Houston Workshop involved only a 3-hour session on science labs, and everyone at the time recognized the discussion as incomplete and open to further comment. Moore assured that the ship would have enough space for science either way, whereas IPSC right now needed to identify the best, most-flexible way to conduct science as well as consider other critical design aspects of the riser ship. Heinrichs suggested that perhaps this question also applied to the non-riser vessel, while Taylor believed that IPSC should consider the broad spectrum of laboratory needs for riser, non-riser, alternate platform, and perhaps continental drilling, rather than plan each component separately. Moore replied that IPSC realized as much, but they also realized, for example, that to drill in the Arctic would require some other platform, and probably one that could not operate full time. Orcutt also expressed concern about the need for a full science party on the ship and whether enough manpower existed to accomplish that on multiple platforms at the same time. Moore acknowledged this concern but believed that the strength of the JR arose from its versatility, and

that required a large staff. He could not say for certain now, but he thought the riser ship would carry fewer scientists at any given time and perhaps a greater total number for a given project.

Arthur Nowell wondered if IPSC brought their recommendations for the formation of working groups to EXCOM for approval. Beiersdorf reminded everyone that EXCOM had previously agreed that IPSC would report through SCICOM. Feary asked whether SCICOM could approve IPSC working groups by email to speed it up, and Hay replied that it was happening even as they spoke. Mutter asked if SCICOM would also hold approval over the plan developed by the science group, and Hay responded that SCICOM would comment on the plan. Orcutt commented that COMPLEX succeeded in illustrating the breadth of interest for new and interesting things that ocean drilling could accomplish, but it did not yield a very focused outcome, so the science group would have to develop a focused plan.

Margaret Leinen expressed strong concern about the process for appointing the working groups. She remembered that EXCOM had previously found itself in an uncomfortable situation when the funding agencies could not get behind the long-range plan, and she thought that EXCOM should ensure that IPSC identified the best people to accomplish the task this time. Orcutt generally agreed, though he mused on whether EXCOM held the same responsibility of oversight toward this group and plan, given that EXCOM would not exist in a few years. Mutter echoed the concerns about the mandate given to the working group for science planning. Moore did not feel so concerned about the membership of the science group and thought they could do the job. Hay remarked that SCICOM could not devote as much time as IPSC did in identifying the working group members, but he assured that SCICOM would not shy away from commenting on the working group report. Beiersdorf suggested that the ICOSOD meeting might provide a good opportunity for reviewing the new long-range plan. Moore said that at least three different groups from the science community would review the new long-range plan, but he agreed that he would not want to see it go up to IWG and fail to get their approval.

Briden thought it would be hard to incorporate all of the themes from COMPLEX in a new long-range plan and wondered if it would be better to focus on certain ones, such as the deep biosphere. Taylor argued that our scientific constituencies belong to many of those other groups and initiatives. They want to use our tools in their programs, and they provide the support that makes it possible to consider this, so we have to set our priorities in the context of that broader interest. Mutter mentioned that many international funding agencies now strive hard to obtain some identifiable human benefits, and Mével asked whether IPSC had thought about a mechanism to interact with other international programs and initiatives. Moore believed that such interaction would come primarily through the proposal process, though IPSC could also consider documents from other groups. He added that as a SSEP chair he had seen how proposal pressure provided a driving force in setting new priorities. Moore also stated that we did not have time to finesse this now; we needed to start two years ago if we wanted to take a more careful approach at this.

Beiersdorf identified the important elements of the discussion regarding IPSC working groups as: 1) a need for working groups, 2) group membership, 3) internal communication among groups, 4) societal relevance of the long-range plan, and 5) timely progress reviews. He noted that although the role and product of ICOSOD remained undefined, it certainly could not resemble CONCORD and COMPLEX in size, so we needed working groups to bring things together first. Briden cited the importance of this issue and suggested discussing it in executive session. Detrick recommended adjourning for the day and returning to this issue the following morning.

Upon reassembling the next morning, Beiersdorf outlined the JOIDES advisory structure with respect to IPSC and noted that EXCOM would not meet again until February 2000, only a few months before ICOSOD. EXCOM should therefore act now if they wanted to comment on the IPSC planning procedures. Beiersdorf then presented a list of seven issues for immediate discussion, and Moore requested to eliminate one item from the list because it was not ready for discussion.

Briden asked what IPSC would do if a working group did all of the science planning. Moore responded that IPSC had a lot to do and could use some help in writing at least a first draft of the science plan, though of course IPSC would review and revise the plan accordingly. Harrison wondered whether IPSC had enough people giving it advice. Beiersdorf noted that EXCOM should first agree to establish the working groups and then worry about membership. Taylor said the committee needed to reach a consensus now and could not wait until the next meeting.

EXCOM Consensus 99-1-4

EXCOM endorses the IPSC plan to form working groups for science planning, industry liaisons, and technology.

Moore appreciated the comments he had already received about particular nominees to serve on the working groups. Orcutt pointed out that a potential conflict of interest might exist with contracts going to members of the technology group. Moore asked if he should withdraw the nomination of the proposed chair, and Orcutt replied that Moore definitely should if any possibility existed that the nominee might enter into a contractual arrangement with OD21. Moore said that IPSC had asked the nominee about a possible conflict of interest, but EXCOM should not hesitate to express any further concerns.

EXCOM Consensus 99-1-5

EXCOM recommends that IPSC recruit working groups for industry liaisons and technology with care taken to avoid possible conflicts of interest.

Moore explained that IPSC wanted to keep the science group small for efficiency, while still maintaining international representation. Mutter wondered whether the science group should include a few scientists with no current involvement in the program. Moore believed that serving on another JOIDES committee or having a proposal in the system should not preclude someone from membership on this panel. Orcutt stressed that the science group members must have the breadth to look across the entire suite of science rather than represent narrow interests, and he warned about possible scientific conflicts of interest. Briden emphasized that we need a *new* science plan and suggested that contemporary interests might not apply to 2004. Leinen remarked that in developing the previous long-range plan, EXCOM made sure to have leadership from people with awareness of its concerns. Beiersdorf then suggested that having good liaisons could perhaps resolve those concerns. Detrick stated that the committee should trust Ted Moore to relay its concerns to IPSC and let them get on with the job.

EXCOM Consensus 99-1-6

EXCOM recommends that IPSC recruit a working group for science planning in consultation with SCICOM, while considering the concerns of EXCOM about the breadth of experience and knowledge of the members as well as potential conflicts of interest.

Moore said that IPSC could provide an expanded early outline of the science plan to EXCOM by this fall to get feedback before going too far. Briden inquired further about the timing of the planning and review process. Moore explained that IPSC hoped to send a first draft by the end of the year to the CONCORD and COMPLEX committees and other independent scientists. Purdy thought that IWG would not want to comment on the science plan itself but only receive assurance that the process was proceeding on schedule. IWG would want to look more closely, however, at the next level of integration among the science, technology, and management plans so they could determine how to implement the overall plan.

Heinrichs expected the integrating phase of the planning effort to coincide with ICOSOD, in the middle of 2000, so IWG could wait until February 2000 to get the initial review of the individual plans. Briden asked for more details about the concept of ICOSOD, and Beiersdorf wondered who would participate in it. Heinrichs responded that ICOSOD would serve as the primary transition point between the ODP council and IWG. It would probably consist of a small group that integrates the science plan, technical requirements, and a first-order idea of staffing and overall costs. The JOIDES science community, through EXCOM, would look at how to do the science, and the government sponsors, through IWG, would look at management and finances.

Moore thought that IPSC could come forward by February with a model for an integrated program, but it would not have the benefit of a broad management review or a science plan with thorough community review. Heinrichs said that IWG would not need a final plan by then but only something they could use to start making short-term plans. Purdy noted that IWG would hear the IPSC report at the August SCICOM meeting and then decide the schedule of future IWG meetings.

EXCOM Consensus 99-1-7

EXCOM endorses the review process proposed by IPSC regarding development of a new long-range plan by the working group for science planning.

Beiersdorf asked when IPSC would need to know the identity of the ICOSOD review committee, and Moore said it depended on how EXCOM wanted to do it. Beiersdorf then wondered if it should consist of an independent group or a subcommittee of EXCOM. Heinrichs said that EXCOM did not have to decide that today, but they should decide how to handle the earlier review of the draft outline. Briden wondered to whom the ICOSOD review committee would report, and Heinrichs answered that the JOIDES advisory structure represents the only science organization we have in place. Beiersdorf noted that EXCOM would expect to discuss the review of the science plan at its February meeting.

Prior asked about the timetable for the technical working group. Moore said that he expected to have a report ready by 1 March 2000, but Taylor asked if IPSC could finish that report in time for the next EXCOM meeting. Moore explained that IPSC could not really produce a good technology plan or budget until they knew the boundaries of the second ship. Feary thought that real numbers would be necessary by the ICOSOD stage, and he asked if IPSC planned to establish a budgetary working group. Moore responded that OD21 would provide a budget estimate for the riser vessel, while the CDC would provide one for a non-riser vessel, and IPSC might use the same consultant as the CDC to get an estimate for alternate platforms. Moore added that the Japanese advisory structure still had to approve the design of a larger riser ship, and then IPSC would have to decide what remained for the third leg of the new program, so they could not get complete cost estimates before the end of this year.

Taylor expressed a strong interest in establishing stronger links with ICDP and other programs. Moreover, he called for an effort to create a unified program for drilling anywhere, not just in the ocean, though he feared that we had already followed a path that bypassed this possibility. Leinen agreed that we should at least articulate clearly to the funding agencies the role of ocean drilling in the context of lake, arctic, and continental drilling, while Dennis Kent noted the complementary nature of these programs and saw this as part of the "third leg" of the new program. Moore commented that other programs could already integrate into ODP and cited ANTOSTRAT as an example, plus the new Arctic PPG that would bring in people from the Nansen Arctic Drilling program.

Taylor argued that in the current framework we merely patch in these other programs, but surely we could do a better job of this in the next program. He predicted that by interacting with these groups we would encounter different scientific problems than we had in the past. Brent Dalrymple questioned where this topic fit on the agenda and whether this meant that we should change everything we had talked about up to now. Mutter thought that the committee should address this important issue, whether it appeared on the agenda or not. Mével agreed but wondered about the best time to do so.

Beiersdorf asked if Taylor thought that our group should take the first steps toward forming a larger group or coordinating committee. Taylor recommended that EXCOM make overtures to other drilling programs to form a joint committee for moving forward on this. He envisioned an opportunity to join with other organizations whose goals and plans resemble ours. Mével wondered how such a joint committee would relate to IPSC, while Moore thought IPSC could produce a broad enough science plan to include the aims of these other programs. Briden recognized the need for justifying the final IODP proposal in general earth science terms, but he could not see a definite need for a broader body to oversee things.

Taylor said that he would prefer to see an integrated proposal go forward to the funding agencies. He could see an integrated science community, but with management and funding structures working against the whole. Taylor recommended that a small group of EXCOM approach representatives of other groups about creating an integrated program, while Detrick said that he would rather see a subcommittee explore a range of options on its own. Beiersdorf agreed and proposed to form a subcommittee that would prepare EXCOM for addressing this issue at the next meeting.

EXCOM Consensus 99-2-8

EXCOM establishes a subcommittee to identify better options for integrating ODP with other scientific drilling programs. This group should prepare a concept document and present it to EXCOM at their next meeting. The subcommittee will consist of Taylor (Chair), Mutter, Orcutt, and Beiersdorf (*ex officio*).

9. SCICOM Report

9.1 Selected ODP achievements from recent legs

Leg 182 Great Australian Bight---discovered high-salinity, hydrogen-sulfide-rich pore fluids on the outer shelf and upper slope, perhaps resulting from evaporation on the shelf during times of lower sea level. Also discovered Bryozoan mounds.

Leg 183 Kerguelen Plateau---found that this large igneous province (LIP) had a long history of development, at times above sea level. This could explain the lack of evidence in the fossil record for development of an isolated fauna on the Indian continent.

Leg 184 East Asian Monsoon---obtained an 8 MY sedimentary record at the southernmost site and even longer records at the northern sites.

Leg 185 Izu-Mariana---deepened a hole into the oldest crust ever recovered in the Pacific to look at subduction processes. Also conducted the first microbiology studies and contamination tests.

9.2 Four-year ship track for *JOIDES Resolution* through FY 2002

Bill Hay reported that SCICOM had not altered the previous four-year ship track, so the *JOIDES Resolution* would continue to operate in the Pacific for now and almost certainly enter the Atlantic before the end of the current program.

9.3 Scheduling of remaining legs and phase-out of JOIDES advisory structure

Hay stated that SCICOM would consider 24 proposals this year, a 50% increase over last year, with only 16 legs at most remaining to schedule by the end of the program. Hay noted that the diagram shown yesterday by Moore outlined the phase-out of the advisory structure.

Briden asked what the JOIDES Office planned to do about the large stack of paper going to committee members for review. Hay answered that he could not do much about it at the moment. Fox wondered if operational constraints could limit the number of proposals, but Hay replied that he had to follow the procedures prescribed by EXCOM.

9.4 Establishment of Arctic and Hydrogeology PPGs

Hay reviewed the goals and mandates of the new Arctic and Hydrogeology PPGs, as established at the previous SCICOM meeting. Detrick felt that the specific mandate of the Arctic PPG did not adequately address certain concerns expressed in the SCICOM minutes. He supported the idea of a thematic focus, but not a regional panel, and hoped that the PPG would not believe they had a mandate to implement the NAD program rather than focus on ODP-related science. Hay tried to allay those concerns and Beiersdorf offered additional assurance.

9.5 Amend Terms of Reference regarding PPGs

Hay presented a request from SCICOM to amend several paragraphs of the Terms of Reference regarding Program Planning Groups. Taylor noted that the proposed changes definitely put the PPGs under oversight of the SSEPs rather than SCICOM.

EXCOM Motion 99-2-9

EXCOM revises the Terms of Reference for Program Planning Groups, as requested by SCICOM. See SCICOM Motion 99-1-7.

Orcutt moved, Harrison seconded; 14 in favor, 1 abstained (Briden).

10. FY 2000 Science Plan and Budget

10.1 Science plan summary

Kate Moran noted that EXCOM had already approved the science plan through Leg 193 (see EXCOM Motion 99-1-8), and she explained that Legs 192 and 193 had since switched places on the schedule. Orcutt inquired about the availability of LWD for Manus Basin. Moran replied that Manus Basin would now come under the next fiscal year's budget, with LWD operations included, and a chance still existed to get additional money for more sophisticated measurements. Orcutt questioned the sense of scheduling such a leg before knowing if we could do it. Hay said that SCICOM had discussed this issue thoroughly and decided it was still worth doing even without the more sophisticated LWD measurements.

10.2 FY 2000 final budget

Moran summarized the FY 2000 program plan, noting that it met the target budget while maintaining innovation. The ship would operate in the western Pacific and Southern Ocean for six science legs and one and one-half engineering legs. Moran also listed various targets for technology development including improved core quality, gas hydrates, advanced CORKs, large-diameter logging tools, and hard-rock re-entry. The FY 2000 budget would total $46.1M.

EXCOM Motion 99-2-10
EXCOM approves the FY 2000 program plan.

Nowell moved, Detrick seconded; 13 in favor, 2 abstained (Mutter, Prior).

11. Review of Membership Status

11.1 ECOD Report

11.2 PacRim Report

Helmut Beiersdorf accepted the membership status reports of ECOD and PacRim as they appeared in the agenda book, and the committee offered no further comments.

EXCOM Motion 99-2-11
EXCOM approves the membership status of ECOD and PacRim.

Leinen moved, Taira seconded; 12 in favor, 2 abstained (Feary, Comas), 1 absent (Orcutt).

12. Future Meetings and Other Business

12.1 Winter 2000, 14–16 February, Washington, D.C.

Moran outlined the plan for the next meeting and possible interaction with government officials.

12.2 Summer 2000, College Station, Texas

Beiersdorf explained that the next summer EXCOM meeting should ideally occur in Japan, but Taira could not host the meeting because he would have a time conflict as a leg co-chief. Beiersdorf therefore recommended College Station, Texas, as a venue and the committee concurred.

12.3 Other Business

EXCOM Motion 99-2-12

As we sit within singing range of the Sydney Opera House, the Three Tenors come to mind. In ODP we have an equivalent in the Three D's, Don Heinrichs, Dietrich Maronde, and David Feary. EXCOM expresses immense gratitude to these three persons who have provided leadership to the Ocean Drilling Program, to EXCOM, and to the ODP Council. We can hardly remember ODP before Don. He has served as the keystone of the ODP structure for almost its entire existence. We thank Don for his leadership and patience in dealing with the advisory structure. And to Dietrich Maronde who has been an enthusiastic supporter and stalwart advocate of ODP for as long as Hans Dürbaum, former EXCOM member from Germany. You will soon join Hans in retirement—perhaps we will see you on PEC-VI. And we thank David Feary for his resolute effort to keep PacRim as a full member and for his hard work to make this meeting so enjoyable. We look forward to seeing him in Washington, D. C.

Approved by acclamation.

Meeting Adjourned **12:25 PM**

Re: ODP Phase-out or ODP-IODP transition

(Proposal for a)
Discussion Paper to be included in the Agenda Book for the upcoming EXCOM Meeting

Dear EXCOM,

Our Committee is the primary governing body of JOIDES. It has the responsibility for establishing policies regarding programmatic issues of ODP. As ODP comes to an end, plans and policies are required for phasing out ODP activities.

We have to make decisions in that regard very soon. Therefore, I have sketched out a scheme, which, I hope, can guide us in developing a firm plan for handling the phase out of ODP and phase-in of the potential successor IODP.

When preparing this scheme it was clear to me that the details of the phasing out of ODP or its transition into a new phase of ocean drilling (IODP) will very much be determined by what follows after ODP. Therefore the scheme is to some extent open-ended

Best regards,
Helmut

The Phase-out of ODP and Transition to IODP (A Generic Plan)

It is proposed that all ODP/IODP entities take up the issues under Items A. and B. for consideration under their own mandates.

A. Fate of ODP property/contracted materials:

1. Drillship

2. Equipment (Shipboard and Shorebased)
    - Present ownership
    - Future ownership
3. ODP Data Base
    - Publications
    - Data Archives
4. Core Repositories
    - Location (Locations)
    - Means of storage,
    - Curation
    - Duration
5. Intellectual Property Rights
    - Technology development
6. Advisory Structure
    - Committees, Panels, etc.
    - Proposal Archives

7. ODP Management
ODP Council
JOI ODP Management Group

B. Implementation Plans

1. An implementation plan with schedules and costs has to be developed for all obligations arising from the goals / objectives defined by consideration of the items listed under A. These obligations must be fulfilled regardless of whether there will be a simple phase-out of ODP or a transition to a successor program. Therefore all entities of ODP must be involved.

Action: All Bodies of ODP

ODP Council
JOIDES Advisory Structure
BOG, Contractors, Subcontractors

2. An implementation plan with schedules and costs has to be developed for all obligations arising from the goals / objectives defined by consideration of the items listed under A., with the assumption that ODP is followed by a successor program.

Action: All bodies of ODP listed above plus all bodies of IODP.

IWG
IPSC/IPSC WGs
JAMSTEC, other Contractors
New Advisory Structure

Note: If the membership of IODP or the decision making process is different from ODP, we will need parallel advisory structures for phasing out ODP and phasing in IODP.

C. How can we reach the goals listed under Item B.?

If EXCOM agrees in principal to the concept of action regarding the phasing out of ODP/ transition of ODP into the successor program, EXCOM should establish a Working Group for devising an outline for an ODP phase-out implementation plan.

1. Preparatory to establishing this ODP Phase-out Implementation Working Group, a small Subcommittee of EXCOM should develop:

A mandate
A task list
A generic membership list (taking into account scientific, technical, operational, managerial, legal, and financial issues).
A list of potential candidates (after having determined their willingness to serve).
A draft letter to all entities concerned. (according to the considerations listed under item A.)

2. The ODP Phase-out Implementation Working Group will be formally established at the Summer 2000 meeting of EXCOM.

3. The letters to ODP and IODP entities will be approved and sent out by the EXCOM.

4. Answers to the letters will be received by the WG.

5. Based on these answers, the WG will then develop an outline for implementation of the phase out plan.

6. After approval by EXCOM at its winter 2001 meeting, JOI will develop and implement a detailed phase-out plan. IODP will devise the complementary phase-in plan.

SCIENCE PLAN

At its August 1999 meeting, SCICOM considered all of the externally reviewed proposals that had been carried forward from last year and those forwarded to it by the SSEPs. The proposals were considered in terms of their relation to the objectives and priorities of the Long Range Plan (LRP). The LRP identifies fundamental scientific problems under two major research themes: Dynamics of the Earth's Environment and Dynamics of the Earth's Interior. Before ranking the proposals, SCICOM discussed the status of investigations of the scientific topics under these two themes.

Proposals 431-Rev (West Pacific Seismic Network) and 517-Full (Second Leg of W. Nankai) had already been considered and highly ranked last year, they were forwarded to OPCOM before ranking the remaining proposals:

SCICOM Motion 99-2-7
SCICOM forwards Proposal 431-Rev to OPCOM without ranking, so as to complete an already highly ranked proposal.

SCICOM Motion 99-2-8
SCICOM forwards Proposal 517-Full to OPCOM for scheduling the second leg of W. Nankai, based on the SSEPs and SCICOM reviews of the scientific plan and contingent upon successful drilling operations during Leg 190 (see SCICOM Motion 98-2-7). SCICOM also encourages the proponents to continue to seek funding to offset the costs of this very expensive leg. SCICOM expects that ODP/TAMU will continue to develop the advanced CORKs and have them completely ready for use by the beginning of the leg. If not, SCICOM views it as critical that the LWD work proceeds as scheduled.

Concerning 517-Full, the Second Leg of W. Nankai SCICOM passed a special motion regarding the development and deployment of advanced CORKs:

SCICOM Motion 99-2-9
SCICOM views the timely development and testing of the advanced CORK system as critical to achieving the objectives of drilling at the Nankai accretionary prism. SCICOM therefore instructs OPCOM to work closely with JOI and ODP/TAMU to ensure that development proceeds appropriately. SCICOM also requests that JOI and ODP-TAMU present at the next SCICOM meeting a timeline for development and testing of the advanced CORKs.

SCICOM also considered the problem of repeated ranking of proposals that were far from the area foreseen for operations, and passed the following motion:

SCICOM Motion 99-2-10

SCICOM expresses concern about highly ranked proposals (those forwarded to OPCOM) that clearly lie outside the projected area of ship operations for several years yet receive a new global scientific ranking each year. Such proposals inevitably slip in rank because of the higher priority placed on those proposals with a geographic urgency to schedule. SCICOM therefore adopts the following procedure:

1) Every proposal, regardless of its geographic location, will receive a global scientific ranking when first reviewed by SCICOM.

2) If OPCOM does not schedule a highly ranked proposal primarily because it lies outside the projected area of ship operations, SCICOM will not automatically re-rank that proposal the following year. When the possibility arises to schedule such a proposal, SCICOM may request the proponents to submit an update, in the form of either an addendum or a revised proposal (not subjected to further external review), for consideration at the spring meeting of the SSEPs.

SCICOM members voted by closed ballot to establish a global scientific ranking of the 19 proposals remaining:

Rank	Proposal	Title
1.	523-Full	Hawaii-Emperor Seamounts
2.	465-----	SE Pacific Paleoceanography
3.	486-Rev2	Paleogene Equatorial Pacific
4.	525-Full	Mid-Atlantic Ridge Peridotite
5.	500-Full2	H2O Long-Term Seafloor Observatory
6.	499-Rev	ION Equatorial Pacific
7.	546-Full	Hydrate Ridge
8.	505-Full3	Mariana Convergent Margin
9.	534-Full	Shatsky Rise
10.	510-Full3	Marion Plateau
11.	489-Full2	Ross Sea
12.	553-Full	Cascadia Margin
13.	451-Full5	Tonga Forearc
14.	535-Full2	735 Deep--Slow Spreading Ridge
15.	477-Full2	Okhotsk and Bering Seas
16.	549-Full	Arabian Sea OMZ
17.	478-Full4	Eastern Nankai (Part A)
18.	478-Full4	Eastern Nankai (Part B)
19.	355-Full7	Peru Margin

SCICOM then voted to forward the top 10 to OPCOM for possible scheduling:

SCICOM Consensus 99-2-11
SCICOM decides to forward the top ten ranked proposals to OPCOM for possible scheduling. See above for a complete list of proposal rankings.

After considering scheduling and operational matters, OPCOM returned three alternative plans to SCICOM for discussion. SCICOM considered these and approved the following schedule:

SCICOM Motion 99-2-21
SCICOM approves the drilling schedule for 2001 and beyond, as shown below. This schedule could change to take advantage of optimal weather windows, but all projects will be scheduled.

510-Full3	Marion Plateau
431-Rev	W Pacific Network - WP-1
517-Full	Nankai (LWD + CORKs)
523-Full	Hawaii-Emperor Seamounts
546-Full	Hydrate Ridge
500-Full2	H2O Observatory
486-Rev2	Paleogene Equatorial Pacific
465----	SE Pacific Paleoceanography

Included in the 2001 drilling is also Manus Basin, which had been scheduled last year.

The relation of these proposals to the major themes of the LRP is as follows:

Dynamics of the Earth's Environment:

The Marion Plateau program will make a major contribution toward understanding the effects of sea-level change on sedimentary systems by defining the absolute magnitude of the major Middle Miocene sea-level fall and the magnitude of younger sea-level changes. It will also contribute to understanding the effects of sea-level change on carbonate sedimentary systems.

Drilling at Hydrate Ridge will investigate the physical properties of gas hydrates and the associated sediments in a region where there is a large supply of methane.

The Paleogene Equatorial Pacific Leg will explore the peculiar conditions that existed in the Pacific during the early Cenozoic the Earth's meridional temperature gradient was at a minimum, and when the equatorial sedimentation system behaved very differently from today.

Although the Hawaii-Emperor Seamounts Leg is primarily directed toward understand the nature of hotspots, it will contribute important information on the orientation of the Pacific plate during the Early Cenozoic, aiding in the interpretation of paleoenvironmental data.

Dynamics of the Earth's Interior:

Manus Basin is unique as an oceanic hydrothermal system in that it is hosted in acidic rocks. It bears a much closer relation to many continental ore deposits than the basalt-hosted hydrothermal systems associated with the mid-ocean ridge.

The W Pacific Network – WP – 1 and H2O Observatory sites will fill major gaps in the global seismic monitoring program.

Nankai II will use Logging While Drilling (LWD) and advanced CORKs to develop a more quantitative understanding of hydrogeologic, geochemical and tectonic processes on a convergent margin.

The study of Hawaii-Emperor Seamounts will explore an important aspect of mantle dynamics by providing a test of the hypothesis that deep-seated mantle hotspots are not fixed, but move with time.

Leg 193	**Manus Basin**
Proposal	**479 Full3**
Title	**Anatomy of a Felsic Volcanic-Hosted Hydrothermal System: Eastern Manus Back-Arc Basin**
Proponents	**R.A. Binns and S.D. Scott**

One of the major goals of the Long Range Plan is to understand interactions between ocean water and hot crustal material in hydrothermal systems. Most hydrothermal systems are associated with the Mid-Ocean Ridge system and involve seawater-basalt interactions. Manus Basin provides a unique opportunity to investigate another class of hydrothermal system, one in which the reactions occur between seawater and acidic volcanic rocks.

The objectives of Leg 193 are to study the magmatic-fluid interactions in a felsic volcanic-hosted hydrothermal system. This will be accomplished by (1) looking at mineralogical, geochemical, and isotopic analyses of mineralized veins and alteration intervals below outflow zones; (2) comparing investigations below shallow and deep inflow zones, particularly using isotopes for tracing the deposition of seawater derived anhydrite and; (3) by performing quantitative modeling of the entire hydrological system using physical and chemical constraints derived from studies of core samples and wall structures of the boreholes.

MAP TO BE INSERTED HERE

Drilling Plan

Four holes are to be drilled in the area of hydrothermal activity. High temperatures and hole conditions may be poor, so logging will be of considerable importance in obtaining data. The logging program for the Leg 193 is designed to obtain the physical, chemical, and structural data essential for characterizing the hydrological parameters, lithological boundaries, and structural features that constrain this hydrological system. In the case of poor core recovery, resistivity, gamma-ray, density and geochemical (GLT) log profiles will define the extent of mineralization in the boreholes much more accurately than the cores alone. Formation MicroScanner (FMS), resistivity and porosity data will allow definition of fracture patterns associated with potential permeable zones and hydrothermal fluid flow. In addition, array acoustic waveform data containing low-frequency Stoneley waves can be used for the detection of permeable fractures and the estimation of fracture hydraulic conductivity.

The "hole cooling during drilling" strategy that ODP has adopted and used in potentially high-temperature (>165°C) holes in the past (i.e. TAG site, Juan de Fuca Ridge, 504B) will sufficiently depress borehole temperatures into a range such that most of the standard logging tools can be used. Using the side-entry sub (with some extra time) allows for hole cooling by pumping during logging operations. Standard logging tools can be run reliably to approximately 165°C. The LDEO and/or University of Miami high-T temperature tools are recommended for use at elevated borehole temperatures.

In the event that hole conditions are poor, the LWD resistivity and gamma ray tool (CDR) will be available. Since key mineralization zones are located immediately below the seafloor, the CDR will allow these shallow (<90 mbsf) zones to be logged with minimal hole degradation. The CDR log is obtained without stopping to recover core, reducing the chances of borehole wall collapse. The CDR records gamma-ray and borehole-compensated deep and shallow resistivity measurements, permitting correlation between holes and assessment of lithology and fracturing. The temperature limit for the CDR is 150°C, but pumping while drilling with LWD should cool the hole continuously and significantly more than during wireline logging.

If additional funding becomes available, a more robust approach can be achieved by deploying resistivity-at-the-bit (RAB) and/or azimuthal density neutron (ADN) tools. These LWD tools measure azimuthal density and reliable neutron porosity (ADN) in high-porosity environments and provide at-the-bit resistivity (RAB) and resistivity images, which are similar to an FMS log. The resistivity and density azimuthal data, as well as measurements made at the bit itself, can be particularly valuable for investigations of macrostructures within faults or fractures. The data should be obtained before any significant hole degradation or pore pressure changes occur. With this enhanced LWD approach, the ephemeral and physical properties in fractured environments can be observed and more accurately interpreted.

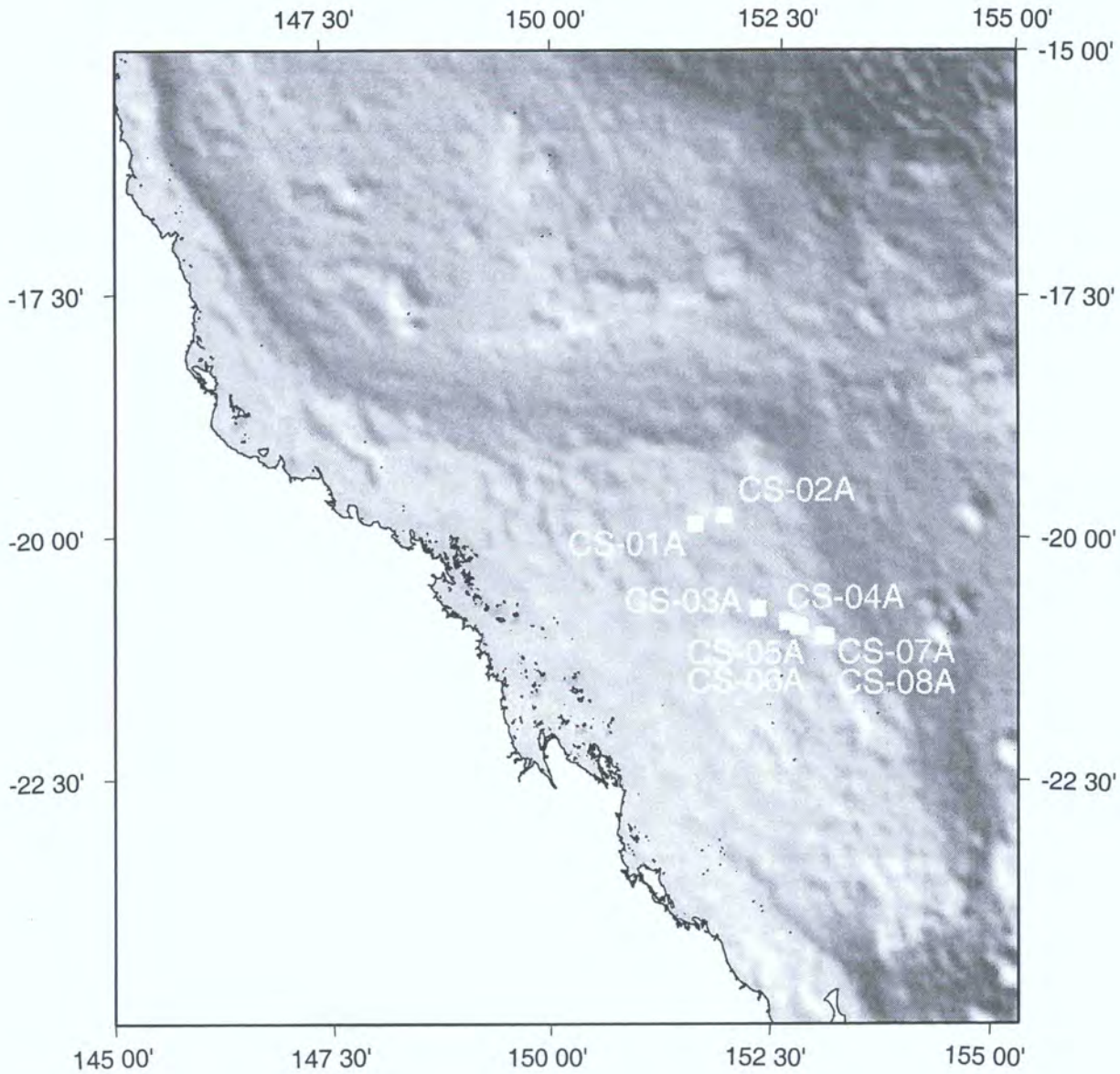
Leg 194	**Marion Plateau**
Proposal	**510-Full3**
Title	**Sea-Level Magnitude and Variations Recorded by Continental Margin Sequences on the Marion Plateau, Northeast Australia**
Proponents	**A.R. Isern, C.J. Pigram, D. Muller and F. Anselmetti**

Cretaceous rifting in the western Coral Sea formed a number of continental fragments, which are now capped by carbonate platforms. Leg 194 will drill a series of holes on one of these fragments, the Marion Plateau. The drilling will address the causes, magnitudes, and effects of sea-level change on continental margin sediments – a major objective of the ODP Long Range Plan. Specifically, the drilling transect on the Marion Plateau will investigate the Miocene sea-level variations and their influence on continental margin sediments. The Leg will build on the achievements of earlier ODP drilling in the region (Leg 133), targeting sequences with a high likelihood of successfully resolving major scientific problems. This program builds on the results of previous sea-level legs in the Bahamas and on the New Jersey Margin.

It is widely accepted that sea-level fluctuations are fundamental in controlling the nature and geometry of continental margin deposition, but much of our knowledge is qualitative. The program on Marion Plateau is designed to provide quantitative information that can be used to calibrate the global sea-level curve. This region provides a unique opportunity to determine the absolute magnitude of one of the major Cenozoic sea-level falls.

The drilling strategy outlined for the Marion Plateau utilizes the stratigraphic relationship between an early to middle Miocene and late Miocene second-order highstand carbonate platform complexes to determine the absolute magnitude of the middle Miocene N12-N14 sea-level fall. The middle Miocene sea level fall caused a shift in the locus of carbonate platform deposition. The sites to be drilled lie along a single strike line on a single structural element. Thermal subsidence of the platform should have affected all sites equally, enabling an accurate measure of the amplitude of the sea-level fall.

In addition to the N12-N14 sea-level fall, the Marion Plateau also has an excellent overall Miocene sea level record including a complete third order event stratigraphy between 30-4 Ma.



Drilling Plan

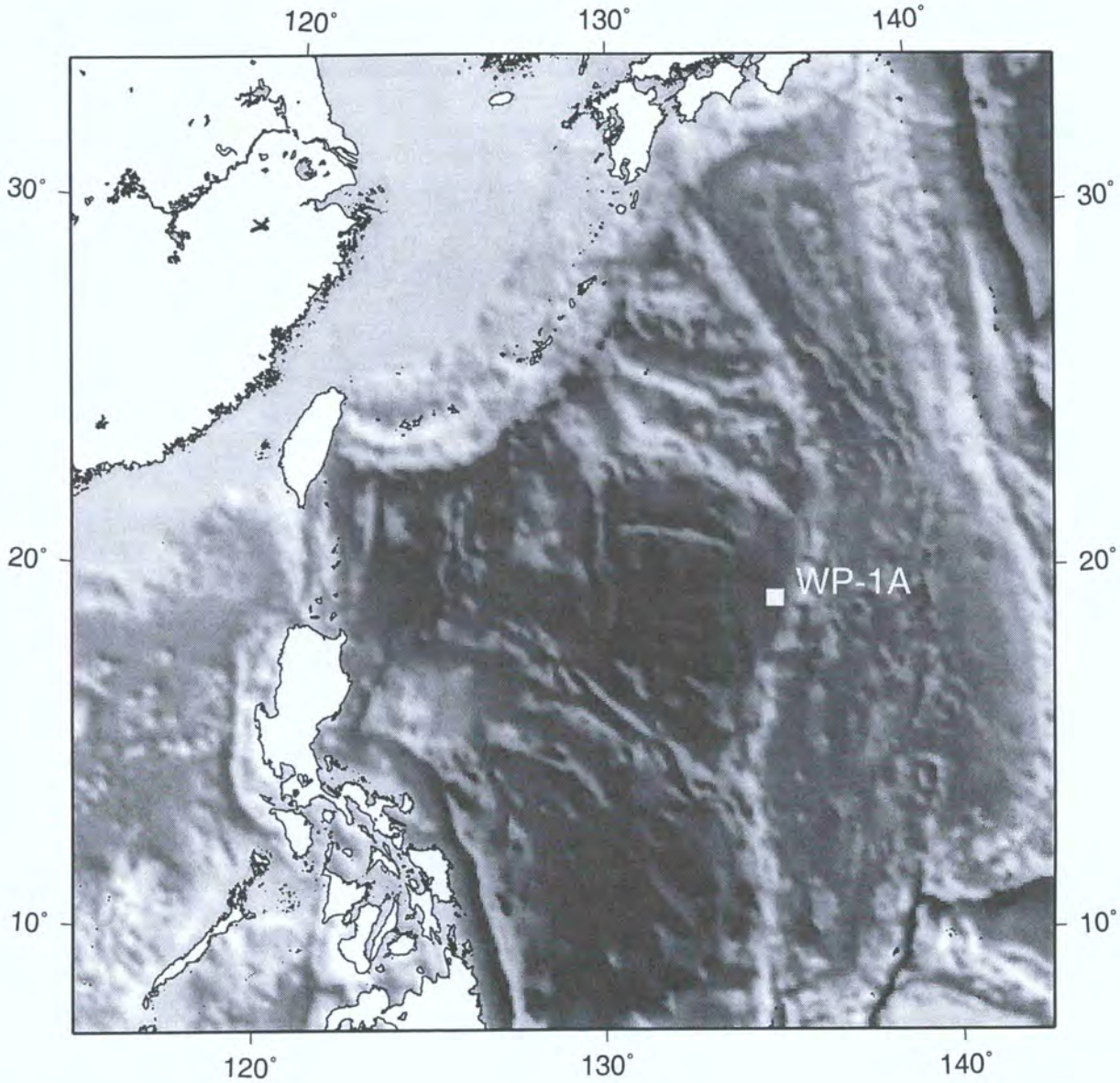
The objectives of the investigation will be accomplished by drilling 8 sites extending from shallow water across the platform edge and onto the slope. This transect will make it possible to date the shallow water carbonates by correlating them into the deeper section with planktonic microfossils using seismic data.

Standard logs (gamma, density, resistivity, porosity) combined with detailed sonic and WST logs will assist in defining correlation horizons in the stratigraphic sections.

Leg 195	**WP Seismic Network**
Proposal	**431**
Title	**W. Pacific Seismic Network**
Proponents	**K. Suyehiro, H. Fujimoto, T. Kanazawa, J. Kasahara, Y. Fukao, H. Momma, K. Fujioka, T. Matsumoto, H. Kinoshita, S. Sacks, A. Linde**

Plate consuming boundaries are concentrated in the Western Pacific area. It is most suitable region to study the dynamics of plates undergoing subduction, formation and evolution of island arcs and marginal seas, and the relation of these processes to mantle convection. Over the past years a dense regional geophysical network has been established on the land areas. The network in Japan is one of the densest sets of seismic stations in the world, and good coverage extends throughout eastern Asia. However, the land network needs to be supplemented by stations that can provide data from the mid-ocean floor and from the plate subduction boundary. Development of the ocean seismic network is proceeding through ODP boreholes that are outfitted as long-term geophysical observatories. They provide unique seismic data hitherto unavailable. These data will help to quantify the dynamics of subducting plates from their entry into the mantle to their destruction in the deep mantle.

The proposal for the Western Pacific Geophysical Network called for two sites which had been endorsed by the International Ocean Network (ION). The long-term ocean seismic observatory network was included as an initiative in the ODP Long Range Plan (LRP) as a contribution to the Global Seismic Network. The GSN has been successful is resolving the earth's interior from land and island based seismic installations, but still lacks coverage in large areas of the oceans. Two Western Pacific sites are designed to aid study of earthquake dynamics, the dynamics of the subducting plates, the formation of island arcs, and the relation of these processes to mantle convection. The first of the sites is scheduled for drilling during FY 00 and the second is scheduled here for drilling in 2001. Long-term seismic observatories will be installed at both sites. Both observatories are to be connected to nearby telecommunications cables.



Drilling Plan

A quiet and stable borehole is required for installation of the long-term seismic observatory.

The logging program will measure physical properties, anisotropy, and hole shape, similar to what was done at pilot site OSN-1 during Leg 136. Logs must be acquired prior to installation of any downhole instrumentation. The laterolog will measure resistivity in basement intervals. Standard geophysical logs will measure physical properties; hole volume can be estimated with high accuracy using the BHTV log in the basement intervals. This will improve grouting procedures for the strain sensors and emplacement for the seismometers. High-resolution temperature logs will be used to identify permeable zones and in-flow/out-flow from both drilling-induced and natural fractures in the holes.

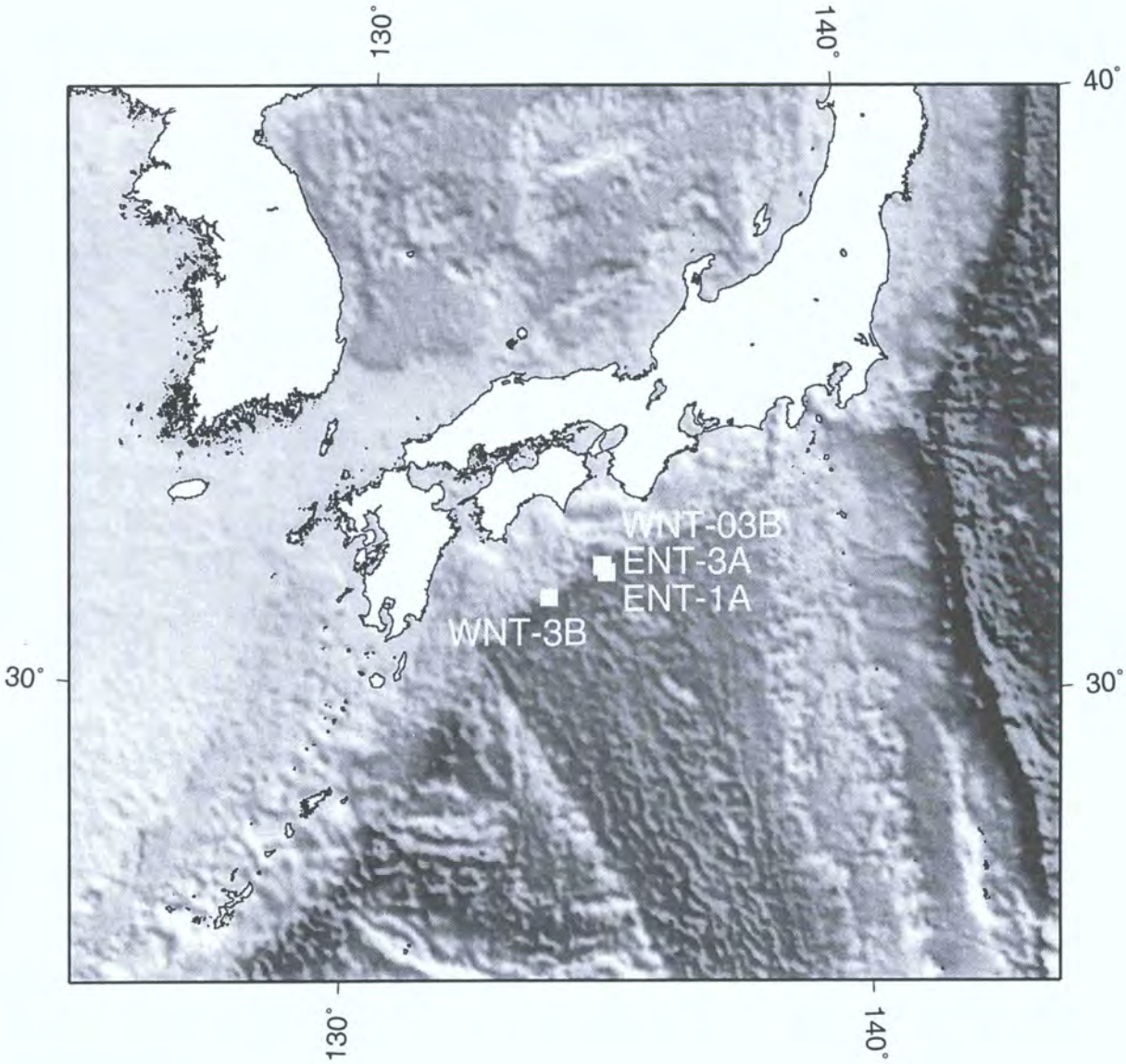
Leg 196	**Nankai Trough LWD & A-CORKS**
Proposal	**517-Full**
Title	**Nankai Trough LWD / Advanced CORK Experiments**
Proponents	**K. Becker, E. Davis, G. Moore, M. Kinoshita, T. Gamo, A. Taira, H. Tokuyama, K. Suyehiro, M. Yamano, E. Kikawa, T. Matsumoto, H. Kinoshita**

This is the second Leg of the Nankai Trough program designed to investigate hydrogeologic, diagenetic, and tectonic processes in an accretionary prism. Nankai Trough is a classic example of a convergent margin where a thick section of clastic sediment is being accreted. It is known for its structural simplicity, shown in excellent high-resolution seismic profiles. Leg 196 will be devoted principally to LWD (Logging-While-Drilling) and installation of Advanced CORK hydrologic observatories, at sites either scheduled to be cored during ODP Leg 190 in 2000 or cored previously during Leg 131. The observations resulting from this leg and later gleaned from the CORK observatories will help develop rigorous mechanical, geochemical and hydrologic models of fluid-related diagenetic and tectonic processes rapidly deforming accretionary wedges.

New features of Advanced CORKs include a multi-level isolation/monitoring/testing capability essential to understanding the fluid flow regime at the Nankai accretionary prism. They also include provision for future deployment of instrument strings by wireline vehicle.

NOTE: THE FOLLOWING SECTION MUST BE REVISED AFTER CHANGES IN SITE LOCATION AND STRATEGY:

This second leg includes LWD measurements and Advanced CORK installations in a transect of three sites in the eastern Nankai Trough that will have been cored to basement on Legs 131 or 190: (1) ENT-01A, a reference site about 14 km seaward of the frontal thrust at the toe of the prism, (2) ENT-03A, penetrating the proto-thrust zone about 1.5 km seaward of the frontal thrust, and (3) Site 808 (Leg 131), penetrating the frontal thrust. The LWD program will be focused on determining the porosity / density / velocity structure. The multi-level Advanced CORK seals are to be configured to determine elastic and hydrologic parameters and to monitor fluid flow processes in the frontal and proto-thrust zones, the decollment and proto-decollment, the sediments above and below the decollment, and the upper oceanic basement of the downgoing plate. This second leg is also to include LWD measurements at WNT©03B, a comparative western proto-thrust site to be cored during Leg 190, and 50 m of basement coring and hydrologic tests at the reference site ENT-01. Following the Leg, the JAMSTEC wireline reentry system will be used to download pressure data from the Advanced CORKs. The reentry system will then install thermistor-tiltmeter-seismometer instrument strings in the Advanced CORKs, geochemical monitoring systems on the fluid sampling ports, and set up coordinated seafloor monitoring systems. Ultimately, links to fiber-optic cables on the seafloor may extend the lifetimes of these experiments from several years to decades. With such long-term monitoring of multiple parameters at multiple sites it will be possible to study strain and changes in the hydrology and mechanical properties of the Nankai accretionary prism through a significant part of the subduction thrust earthquake cycle.



Drilling Plan

NEW PARAGRAPH NEEDED HERE AS DRILL SITES HAVE BEEN MOVED

State-of-the-art LWD tools are to be used to make high-quality porosity and density (ADN) logs from the seafloor to TD, to measure resistivity images, similar to FMS images, and to measure gamma radiation at the bit. LWD sonic tools only operate in formations with Vp > 2km/s and are not likely to be useful in low-velocity formations (Vp <1.8 km/s). As demonstrated by the results from Leg 156, 170, and 171A, the information acquired from these LWD logs will also allow in-situ pore pressures within the accretionary prism to be inferred.

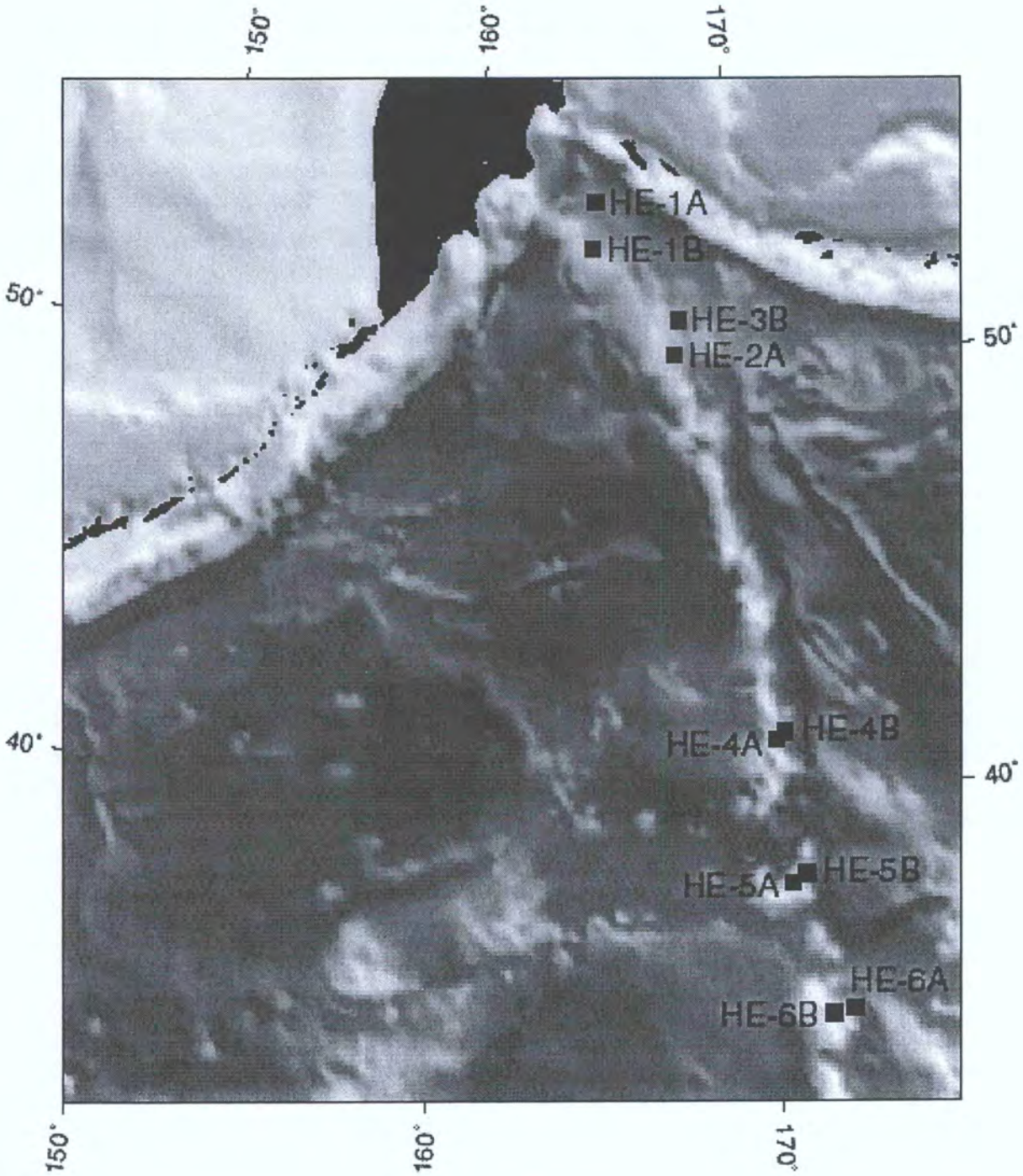
The Resistivity-at-the-bit (RAB) tool will acquire azimuthal resistivity images of the borehole to detect resistivity heterogeneity and borehole structures (fractures and stratigraphic contacts - like FMS but lower resolution), total gamma-ray measurements for lithology estimation, and four depths of investigation.

The Azimuthal Density Neutron (ADN) tool will provide borehole-compensated formation density, neutron porosity, and photoelectric factor measurements in four quadrants around the borehole. A WST may be needed to accurately correlate borehole time-depth events to nearby seismic sections and borehole seismometer records.

Leg 197	**Hawaiian Hotspot & Emperor Seamounts**
Proposal	**523-Full**
Title	**Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts: a Paleomagnetic Test**
Proponents	**J.A. Tarduno, R.D. Cottrell, B. Steinberger**

Assuming a fixed-hotspot frame of reference, the bend in the Hawaiian-Emperor chain has often been cited as the best example of a change in plate motion. Alternatively, the bend might be a record of the motion of the Hawaiian hotspot relative to the Pacific lithosphere. Four lines of inquiry support the latter view: 1. global plate motions predicted using relative plate motion data; 2. spreading rate data from the North Pacific basin; 3. mantle flow modeling utilizing geoid and seismic tomographic constraints; and 4. new paleomagnetic data from the Emperor chain. The best available paleomagnetic data suggest that Pacific hotspots may have moved at rates comparable to those of lithospheric plates in Late Cretaceous to early Tertiary times (81-43 Ma). If correct, this requires a major change in how we view mantle dynamics and the history of plate motions.

Leg 197 will test the hypothesis of southward motion of the Hawaiian hotspot by drilling 5 seamounts of the Emperor trend. The principal objectives are to obtain moderate penetrations of the basement (150-250 m) to obtain samples suitable for radiometric age and paleomagnetic paleolatitude determinations. A comparison of these dated paleolatitude values versus fixed- and moving-hotspot predictions form the basis of the proposed test.
This sampling strategy will also allow us to address important geomagnetic questions which require paleomagnetic data from the Pacific plate, including the history of the time-average field and its paleointensity. The data will place fundamental constraints on the Late Cretaceous to early Tertiary motion of the Pacific plate. An improved picture of this motion history is needed if proxy climatic data from previous and future drill sites are to be used to define past latitudinal gradients.



Drilling Plan

Testing the hypothesis of southward motion of the Hawaiian hotspot will be accomplished by drilling 5 seamounts of the Emperor chain. The drilling is to achieve moderate penetrations of the basement for the purpose of obtaining samples suitable for determining radiometric age and paleomagnetic paleolatitude.

The water depths at the proposed sites vary between 1300 - 3000 m with proposed penetrations between 40-1000 m of sediments (mostly silty clays, volcanic ashes, claystones) and 150 to 250 m basement rocks (basalt flows).

The logging program will involve use of two standard tool strings (Triple-Combo / FMS-Sonic) and a magnetometer, requested as a third party tool. The log data are required mainly for core orientation to

determine the dip of flow units to evaluate the possible effect of tectonic tilting. Magnetic/susceptibility tools may enable the definition of larger eruptive sequences if the mineralogy changed or if the magnetic field reversals occurred. The GHMT may be a useful tool, providing continuous magnetic susceptibility logs in the sediment section, and total field logs in both the sediment and basement. A downhole polarity stratigraphy is likely to be derived from the GHMT logs in the sediment sections. A large part of the basement section may be within the range of the susceptibility tool (it measures up to 1.6 x 10-2 SI). The GPIT (inclinometry tool), run as an integral part of the FMS tool string, can also provide magnetic field data. If magnetic susceptibilities are expected to be higher, a third party magnetometer may be required, The resistivity tool has been the most valuable for the identification of single lava flows in the upper oceanic crust as well as in subaerial flood basalts.

Leg 198	**Hydrate Ridge**
Proposal	**546-Full**
Title	**Drilling Hydrates on Hydrate Ridge, Offshore Oregon**
Proponents	**A. Trehu, M. Torres, S. Giovannoni, C. Goldfinger, E. Suess, K. Brown, M. Kastner, N. Bangs and D. Hammond**

Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change.

Seismic data across Hydrate Ridge, off Oregon, show systematic variations in stratigraphic and reflectivity of the Bottom Simulating Reflectors (BSRs) that appear to be indicative of the impact of tectonic activity on the evolution of the hydrate/gas system of the Oregon margin. These patterns are especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive hydrate deposits near the seafloor.

Leg 198 will drill three holes, 400-700 m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of in situ measurements, to address the following specific objectives:

1) Compare the source region for gas and the physical and chemical mechanisms of hydrate formation in two distinctly different sedimentary and tectonic environments: (a) the older sediments of the accretionary complex, where massive hydrates and associated authigenic carbonate are found near the seafloor and methane may originate in underthrust sediments, and (b) the younger, well-stratified sediments of the adjacent, rapidly-filling slope basin, where seismic reflectivity indicates deeply buried hydrate and/or free gas but no significant hydrate and/or carbonate accumulations near the seafloor. Here the gas source is likely to be more local.

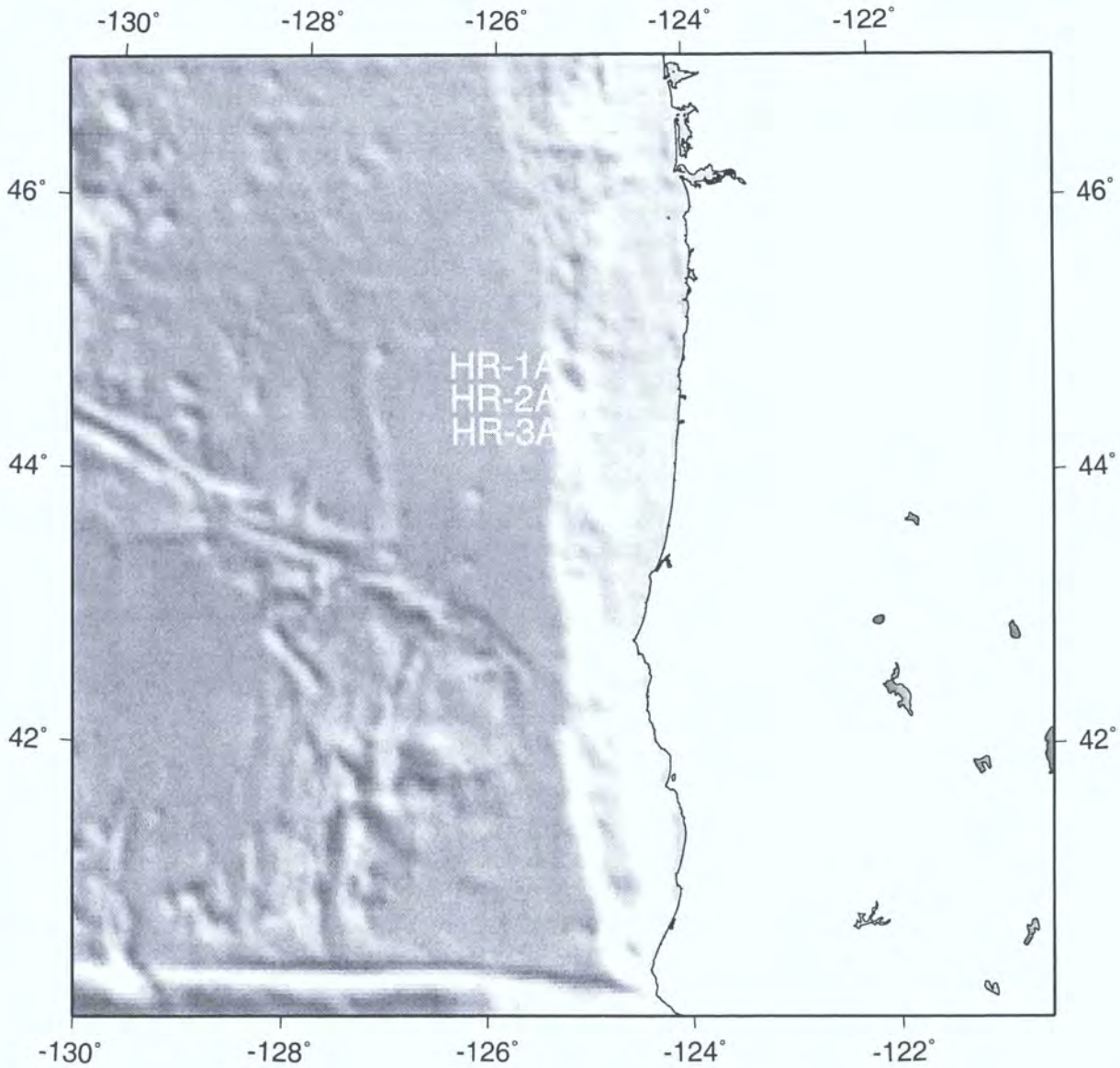
2) Calibrate estimates of hydrate volumes and underlying free gas content determined with geophysical remote sensing techniques. A better understanding of these properties is needed to map hydrate distribution regionally between drill sites, permitting us to evaluate the future economic potential of gas hydrates in subduction zone environments.

3) Test, using geochemical tracers, physical properties measurements, and microstructural analysis, whether variations in BSR and subBSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data.

4) Develop an understanding of the geochemical effects of hydrate formation in order to identify paleo-proxies for methane release that can be used to integrate the geologic data into climate models and understand the possible role of massive, catastrophic hydrate destabilization on global change.

5) Determine the porosity and shear strength of hydrated and underlying sediments in order to evaluate the relationship between hydrates, fluid flow and slope stability.

6) Quantify the distribution of methanogenic and methanotropic bacteria in the sediments in order to evaluate their contribution to hydrate formation and destruction and related sediment diagenesis.



Drilling Plan

Three 400-700 m deep drill holes are proposed along with an extensive downhole measurement program. These activities are to: 1) calibrate estimates of hydrate and free gas volumes with remote sensing techniques, 2) measure in situ physical and seismic properties and correlate variations with the BSR and sub-BSR reflectivity, and 3) estimate the porosity and shear strength of hydrate-bearing and underlying sediments to evaluate slope stability and fluid flow effects.

Wireline logging tools, VSP, pressure core sampling, and LWD are proposed to during a mini-leg to determine the formation mechanisms of the shallow, massive Hydrate Ridge.
State-of-the-art LWD tools are to be used to measure high-quality porosity and density (ADN). Standard wireline logging tools should also be deployed. The laterolog (DLL) may only be needed in the unlikely event that the bulk resistivity is extremely high. Previously measured resistivities at nearby Site 889 and Site 890 were <1.0 ohm and <2.5 ohm, respectively, and therefore the standard induction resistivity tool (DITE) should provide adequate results. Both P&S velocity measurements are required to achieve the proposed objectives and the standard DSI tool should be used. The 3-component VSP tool is also needed to record the proposed offset VSP experiments.

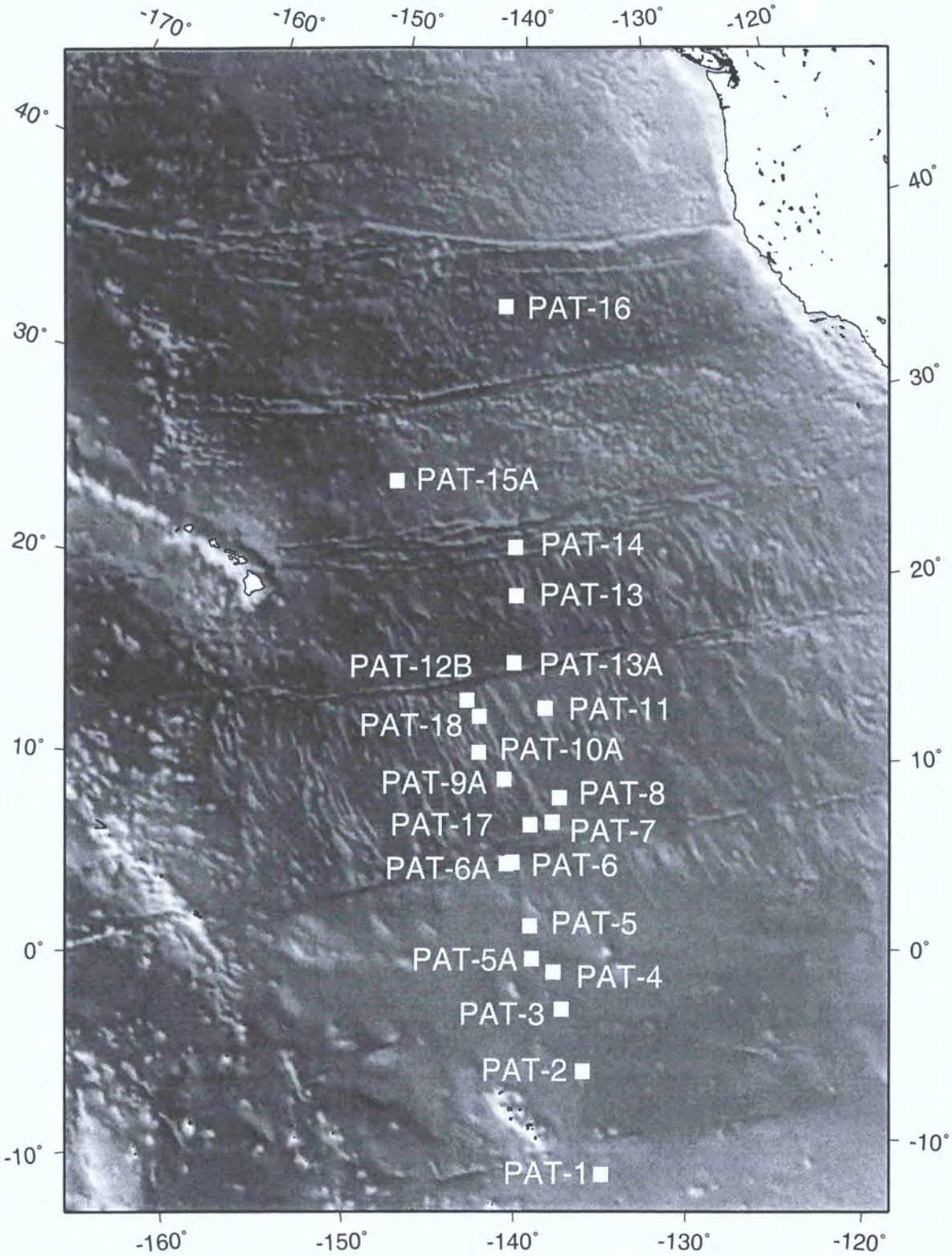
Leg 199	**Paleogene Equatorial Pacific Transect**
Proposal	**486**
Title	**Paleogene Equatorial Pacific Transect**
Proponents	**M. Lyle, D.K. Rea, T.C. Moore and L.D. Stott**

The complex system of equatorial currents is one of the most persistent and clear traces of wind-driven circulation in the oceans. The unequal hemispheric thermal gradients in the modern oceans have pushed the Inter-tropical Convergence Zone (ITCZ) north of the equator and given rise to a narrow band of equatorial upwelling. This zone of upwelling and high productivity results in a high flux of biogenic debris within 1.5°–2° of the geographic equator, with peak values restricted to an even narrower zone. In the Pacific Ocean the rain of this debris has built, over geologic time, a mound of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of over 500 m.

The central equatorial Pacific is unique among the world's oceans in that the path of plate motions carries this linear trace of equatorial upwelling and productivity northward with time. There are two clear impacts of this northward plate motion: 1) the thickest part of the equatorial mound of biogenic sediment is displaced several degrees to the north of the equator and 2) sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within the reach of the Ocean Drilling Program's APC/XCB technology. For the most part the sediments have never been subject to strong burial diagenesis and can be cored easily with little disturbance. Time intervals notorious for extensive chert formation (e.g. the middle Eocene) are more likely to contain only oozes because they have never been buried deeply.

Over the last decade APC/XCB technology has been used to recover continuous Neogene sediment sections from the equatorial Pacific and to trace the variations in equatorial upwelling and biogenic flux during the transition from a one-pole ice age to a two-pole ice age. They have revealed intervals of very high flux rates linked with oceanographic and climatic change. The completely recovered Neogene sections have also been used to integrate biostratigraphy and paleomagnetic stratigraphy and have permitted the establishment of an orbitally tuned time scale back to 14 Ma. Leg 199 will take this coring technology back to the early Paleogene section, the time of the "hot house world."

Leg 199 will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The main objective of the drilling will be a detailed investigation of the oceanographic consequences of the long term cooling since the beginning of the Eocene. Three related questions will also be addressed by this transect: 1) what has been the long-term history of the intensity of atmospheric circulation; 2) what has been the latitudinal movement of the intertropical convergence zone (ITCZ) - a key indicator of the relative temperature gradients in the northern and southern hemispheres; and 3) what has been the history of hydrothermal activity during the Eocene and how might it relate to either warm climates or chert formation? From earlier DSDP rotary coring it is predicted that many of the planned drill sites should have a hiatus or a radiolarian ooze/red clay interval from the Holocene until about the middle Miocene. Below the carbonate-poor interval, there will be lower Neogene and Paleogene calcareous oozes that will permit detailed reconstructions of Eocene sea surface temperature (SST) gradients and equatorial circulation and productivity. Northern sites in the proposed transect may contain only clays above the calcareous lower Eocene sediments. These sections are critical to mapping the movement of the ITCZ through time and to relating the extremely warm interval of the early Eocene to the history of hydrothermal activity. The southern sites are critical to mapping circulation changes during the rapid Eocene - Oligocene transition in calcareous sections.



Drilling Plan

The program consists of 11 primary APC sites. The objectives are 1) to study the paleoceanography of the Early Eocene warm climatic episode. Sites will be drilled on ~60Ma crust to ensure the carbonates needed for productivity and SST (sea surface temperature) work are preserved (i.e. were deposited near the ridge-crest, above the CCD). This transect will delineate the evolution of equatorial current system (upwelling, productivity, temperature, etc.) for the purpose of understanding the causes of "hothouse";

2) to track the position of the ITCZ (inter-tropical convergence zone), and the intensity of the trade winds, over the early Neogene and Paleogene. The position of the ITCZ will be determined from the composition of the aeolian fraction (Asian loess to the north and American andesitic ash to the south).

Logs will be to delineate the stratigraphic position of the chert layers, and for precise depth matching of cored sections. The logs should also provide proxies for lithology and for characterization of in-situ physical properties. High-resolution resistivity measurements with the FMS tool may be useful for the quantification of sedimentary cycles. Chert layers are more likely to occur in the lower part of the boreholes, therefore within the reach of most logging tools - FMS images should pick out the resistive chert bands quite well.

JOIDES OPERATIONS COMMITTEE MEETING

LONG MARINE LABORATORY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

17 August 1999

Members

R. Carter	Australian Geological Survey Organisation, Canberra, Australia (PacRim)
W. Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany (OPCOM Chair)
D. Hodell	Department of Geology, University of Florida, USA
J. C. Moore	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Natland	Rosenstiel School of Marine & Atmospheric Sciences, University of Miami, USA
K. Tamaki	Ocean Research Institute, University of Tokyo, Japan

Liaisons

J. Baldauf	Ocean Drilling Program, Texas A&M University, USA
M. Ball	U.S. Geological Survey, Denver, USA (PPSP Chair)
J. Diebold	Lamont-Doherty Earth Observatory, Columbia Univ., USA (SSP Chair)
B. Malfait	National Science Foundation, USA
K. Moran	Joint Oceanographic Institutions, Inc., USA
M. Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA

Guests

T. Davies	Ocean Drilling Program, Texas A&M University, USA
D. Goldberg	Lamont-Doherty Earth Observatory, Columbia University, USA

JOIDES Office

W. Brückmann	Science Coordinator

A. Approval of minutes from the last meeting

OPCOM unanimously approved the minutes of the last meeting.

B. Presentation of the FY 2001 budget

Moran presented the framework of the FY 2001 budget:

FY01 budget estimate:	
Avg cost/leg based on FY 00 :	**5.5 $M**
Avg cost for 6 legs:	**33.0 $M**
Cost of program services (+2%):	**11.6 $M**
Project development technology Downhole tools	**2.0 $M** (hammer drill, ADCB, PCS, Adara,
A-CORKs for Nankai	**1.4 $M** (casing and packer system)
LWD for Nankai	**0.5 $M**
needs additional money for three A-CORKS with multipackers	
Total	**48.5 $M**
NSF projected target budget	**46.1 $M**

There followed a general discussion of what the average cost of a leg includes. Moran clarified that the estimate of cost was based on the average cost of a leg for the current round of drilling.

C. Scheduling of cruises for FY 2001

For the benefit of the new members on the Operations Committee, Jack Baldauf explained to the panel the Project A strategy. The operator prepares a set of operational options that usually focusses on the perceived top 10 proposals. In the preparation of possible scheduling options the following operational issues are considered:

- Environment (weather windows, sea state)
- Special Oper items
- Minimization of the transit times
- LRP

Baldauf provided OPCOM members and liaisons with a document outlining the key operational parameters and constraints for the proposals selected for FY 2001. An overview of parameters is included below (table 1).

Table 1

Proposal #	Weather window	Time tot.	Site time	Transit time	Estimated total Cost
431C	Feb - May	32	24	8	$129.636
465	Sept - May	58	37	21	$137.575
486	anytime	77	62	15	$111.314
499	anytime	29	14	15	$111.491
500	anytime	53	45	8	$399.792
505	Feb - Jul	61	56	5	$266.670
510	Apr - Oct	58	54	4	$180.699
517	Feb - Jul	64	60	4	$1.800.213
523	Apr - Sept	56	39	17	$190.245
534	Apr - Sept	67	51	16	$199.411
546	Apr - Sept	58	54	4	$838.074

The presentation of scheduling options starts off with the graphical layout of the weather windows using a „bubble plot". From the presentation it became clear that the determining parameter is the Manus Basin Leg.

Model 1

#	rank
431	-
517	-
523	1
546	7
500	5
486	3
465	2

Model 2

#	rank
505	8
431	-
517	- (LWD only)
523	1
546	7
500	6
486	3
465	2

There was a discussion of the costs involved with the advanced CORKS and LWD. The question was raised whether the Japanese community might be willing to provide supplementary funds.
Hodell suggested that Shatsky Rise should be included in the program. Natland inquired about the the weather window for Shatsky. Baldauf replied that the beginning of 2001 may be too early.

Model 3

#	rank	
510	10	
431	-	
517	-	(LWD only)
523	1	
546	7	
500	6	
486	3	
465	2	

Model 4

#	rank	
534	9	
431	-	
517	-	(LWD only)
523	1	
546	7	
500	6	
486	3	
465	2	

There was a discussion of procedures on how the voting to finalize the schedule should proceed. Natland suggested voting on models 2,3,4, then do calculations, come back and vote on the result vs option 1. Hay agreed with this procedure, i.e. either option 1 vs options 2 (A or B or C). Malfait inquired why proposal 499 was not included. Baldauf, Moran, and Fox replied that 499 may be an option for later, on the way to the Atlantic.

The consensus was to present the following options to SCICOM:

Model 1

#	*rank*	*theme*
431	-	earth interior/ION
517	-	fluids (LWD & ACORK)
523	1	earth interior
546	7	hydrates
499 (or 500)	6/5	earth interior/ION
486	3	climate
465	2	climate/tectonics

Model 2

#	*rank*	*theme*
534 (or 510)	9/10	extreme climates or sea level
431	-	earth interior/ION
517	-	fluids (LWD)
523	1	earth interior
546	7	hydrates
499 (or 500)	6/5	earth interior/ION
486	3	climate
465	2	climate/tectonics

Model 3

#	*rank*	*theme*
431	-	earth interior/ION
517	-	fluids (LWD & A-CORK)
523	1	earth interior
546	7	hydrates
499 (or 500)	6/5	earth interior/ION
486	3	climate
465	2	climate/tectonics

Remarks:
Rank # 8 is 505 which is not SSP ready (7)
Rank #4 is MAR

D. Discussion of SciMP recommendations

SCIMP recommendation 99-2-15 had repeated a recommendation from the Houston Workshop, to send out TAMU drilling people to industry operations, that is to put observers on industry deep water vessels. There was doubt as to the effectiveness of this at the present time.

Hay raised Mike Coffin´s point about reviewing, citation and referencing of the Preliminary Reports before they go on the web. After some discussion it was decided that this should be brought up by Mike Coffin again at the next SCICOM meeting.

EU - MAST III Project
HYACE

Technische Universität Berlin

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Dr. William Hay
Joides Office
Wischhof Straße 1-3
24148 Kiel

HYACE tools for technical feasibility tests on ODP Leg 191, July/Sept. 2000

Dear Bill,

as exchanged over the phone during the first week of 2000 I herewith want to inform you and ODP's OpCom about the ongoing planning to have HYACE tools for deepsea feasibility tests on RV "Joides Resolution" during Leg 191. The tools which we plan to send to Yokohama/ Japan are the

- Rotary corer,
- Percussion corer, (to be also used in a push corer version),
- Lab. Transfer mechanism (to take the pressurized core from the downhole autoclave to the lab autoclave).

Attached I give you a (preliminary) list of issues and questions which we are discussing presently with engineers and scientists of ODP.

Please don't hesitate to ask us/me any further questions.

Best regards,

Hans Amann

Hans Amann

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Technische Universität Berlin

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Berlin, 11.01.00

HYACE tools on Leg 191, technical feasibility tests

Issues to be clarified until ~end of June 2000 (this list is a suggestion, more may be needed!)

1. Tools to be technical feasibility tested:
   1.1 Handling onboard, launching, landing, drilling/ coring, retrieving into a downhole autoclave, retrieving the tools to the surface, dismantling onboard, core autoclave transfer, possibly onboard data readout of downhole recorded data (p,T)
   1.2 Tools are, will be the downhole actuated
   - rotary corer,
   - percussion corer,
   - possibly in a push core mode (for soft sediment), and a
   - lab transfer chamber, to take the core from the downhole autoclave to a lab autoclave

   1.3 Handling interfaces on RV "Joides Resolution" will be the ODP XCB wireline fishing tool and the ODP bottom hole assembly (as already defined with Tom Pettigrew). Exact outside dimensions of the rotary and the percussion corer being exchanged with ODP at present.
   1.4 Is there a tool handling and safety procedure manual, e.g. for the XCB, APC, PCS? Should a similar procedure manual be necessary for the HYACE tool? (The pressure vessel of the downhole rotary corer will be/ is being checked and certified by the German TÜV).
2. Leg 191 information being exchanged in the 2 week 2000.
   2.1 Exact drilling locations, water depth, sedimentary/ rock conditions, expected sea conditions,

2.2 When can HYACE be fit into the Leg program? We need about 2x18h operation and test time per tool in order to test the technical feasibility

2.3 How many HYACE engineers can be onboard? Min. 2 engineering for shift work (2x12h/ day) and operating the different tools (as they are being developed by different parties)

2.4 Will there be port calls in between? The engineers don't need to stay onboard two months (C. Escutia on Jan. 10, 20000 : no port call)

2.5 Equipment logistics to Tokyo, RV "Joides Resolution" in July 2000

The HYACE tools will be large scale(1:1) tested from March to about May 2000 at the test facility of ITE in Clausthal, Germany (known to ODP). ODP engineers are welcome to see the performance and discuss details.

Further general information on the project is available on the homepage :

http://www.tu-berlin.de/fb10/MAT/hyace.html

Prof. Dr. Hans Amann

Date: Thu, 23 Dec 1999 09:30:05 -1000 (HST)
From: Greg Moore <moore@akule.soest.hawaii.edu>
Reply-To: Greg Moore <moore@akule.soest.hawaii.edu>
Subject: Leg 190 Prospectus Changes
To: Jack_Baldauf@odp.tamu.edu
Cc: kmoran@brook.edu, whay@geomar.de, ataira@ori.u-tokyo.ac.jp,
aklaus@odpemail.tamu.edu
X-Mailer: dtmail 1.3.0 @(#)CDE Version 1.3.4 SunOS 5.7 sun4u sparc

Dear Jack,

Now that we have had a chance to discuss our Leg 190 plans with colleagues at the AGU meeting, we have settled on a revised operations plan. As you know, our original proposal had three primary sites: a reference site and a site in the protothrust zone (PTZ) along our eastern transect and a site in the PTZ along the western transect. This summer, as part of the Seismogenic Zone Experiment (SEIZE), our group, led by N. Bangs and T. Shipley at UTIG, collected a 3-D seismic grid over the eastern transect area and imaged several exciting targets within the area currently under consideration by IODP for seismogenic zone drilling. In the spirit of ODP's mandate to begin setting the groundwork for IODP drilling, we would like to modify the Leg 190 drilling plan to allow drilling of 2 sites into the seismogenic zone area.

Following our 3-D seismic cruise, we had little time to discuss potential Leg 190 drill targets, so we selected a suite of 6 sites that we sent to the PPSP for consideration. All sites were approved, so we were able to debate the merits of each site during our pre-cruise meeting. We decided that it is essential to drill/core the eastern reference and proto-thrust sites as originally planned, but that we might be able to drop or modify drilling in the western transect in favor of the eastern SEIZE sites. Additional discussions with proponents and others at AGU suggested that the most important aspect of the western sites was the need to sample the part of the section just above and below the decollement zone to determine the nature of the clay mineralogy. This can best be done at a site just seaward of the Leg 87 reference site. We would plan to drill without coring through the upper 300 meters of section that was already cored at Site 582 and then core about 400 meters of section below that. The time savings of this minimal site vs. the western PTZ site will be about 13 days, which will be spent on the eastern SEIZE sites. The western proto-thrust site remains a high alternate priority if time remains at the end of the leg.

Our proposed new drilling plan will be:

1. ENT-01A (eastern reference site; original # 1 priority)
2. ENT-03A (eastern PTZ site; original #1 priority)
3. ENT-07A (eastern slope basin site; new)
4. ENT-06A (eastern out-of-sequence thrust site; new)
5. WNT-01A (western reference site; original alternate site)

WNT-03B will be changed from primary to alternate site.

We hope that these changes will be acceptable to you and the JOIDES structure. Please let us know if you have any questions.

Regards,

Greg Moore and Asahiko Taira

JOIDES SCIENCE COMMITTEE MEETING

LONG MARINE LABORATORY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

15–18 August 1999

Science Committee - SCICOM

G. Bond	Lamont-Doherty Earth Observatory, Columbia University, USA
K. Brown	Scripps Institution of Oceanography, University of California, San Diego, USA
M. Coffin	Institute for Geophysics, University of Texas, USA
W. Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany
D. Hodell*	Department of Geology, University of Florida, USA
N. Holm	Department of Geology and Geochemistry, Stockholm University, Sweden (ECOD)
S. Humphris	Woods Hole Oceanographic Institution, USA
E. Klein	Department of Geology, Duke University, USA
K. Miller	Department of Geological Sciences, Rutgers University, USA
J. C. Moore	Department of Earth Sciences, University of California, Santa Cruz, USA
A. Robertson	Department of Geology and Geophysics, University of Edinburgh, UK
S. Srivastava	Bedford Institute of Oceanography, Dalhousie University, Canada (PacRim)
K. Tamaki	Ocean Research Institute, University of Tokyo, Japan
D. Wiens	Department of Earth and Planetary Science, Washington University, USA
J. Zachos**	Department of Earth Sciences, University of California, Santa Cruz, USA

* Replaced M. Raymo for this meeting only
** Replaced J. T. Overpeck for this meeting only

Associate Member Observers

J. Ludden	CNRS, Nancy, France
Z. Zhou	Department of Marine Geology & Geophysics, Tongji University, Shanghai, China

Liaisons

J. Baldauf	Ocean Drilling Program, Texas A&M University, USA
D. Goldberg	Lamont-Doherty Earth Observatory, Columbia University, USA
B. Malfait	National Science Foundation, USA
K. Moran	Joint Oceanographic Institutions, Inc., USA

Guests

M. Ball	U.S. Geological Survey, Denver, USA (PPSP Chair)
B. Bekins	U.S. Geological Survey, Menlo Park, USA (ESSEP member)
P. Delaney	Department of Ocean Sciences, University of California, Santa Cruz, USA (CDC Chair)
J. Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA (SSP Chair)
J. Farrell	Joint Oceanographic Institutions, Inc., USA
J. Fox	Ocean Drilling Program, Texas A&M University, USA
H. Fujita	JAMSTEC, Japan
H. Kinoshita	JAMSTEC, Japan
K. Kitazawa	JAMSTEC, Japan
N. Lundberg	Department of Geology, Florida State University, USA (ESSEP Chair-elect)
T. Moore	Department of Geological Sciences, University of Michigan, (ESSEP and IPSC Chair)
M. Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA
M. Shinano	JAMSTEC, Japan
S. Takagawa	JAMSTEC, Japan
S. Tanaka	Science and Technology Agency, Japan
J. Tarduno	Department of Earth & Environmental Sciences, University of Rochester, USA (ISSEP Chair)

JOIDES Office, GEOMAR Research Center, Germany

W. Brückmann	Science Coordinator
J. Schuffert	U.S. Liaison
B. Rohr	Administrative Assistant

JOIDES OPERATIONS COMMITTEE MEETING

LONG MARINE LABORATORY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

16–18 August 1999

Operations Committee - OPCOM

R. Carter	Australian Geological Survey Organisation, Canberra, Australia (PacRim)
W. Hay (Chair)	GEOMAR Research Center, University of Kiel, Germany (OPCOM Chair)
D. Hodell	Department of Geology, University of Florida, USA
J. C. Moore	Department of Earth Sciences, University of California, Santa Cruz, USA
J. Natland	Rosenstiel School of Marine & Atmospheric Sciences, University of Miami, USA
K. Tamaki	Ocean Research Institute, University of Tokyo, Japan

Liaisons

J. Baldauf	Ocean Drilling Program, Texas A&M University, USA
M. Ball	U.S. Geological Survey, Denver, USA (PPSP Chair)
J. Diebold	Lamont-Doherty Earth Observatory, Columbia University, USA (SSP Chair)
B. Malfait	National Science Foundation, USA
K. Moran	Joint Oceanographic Institutions, Inc., USA
M. Reagan	Lamont-Doherty Earth Observatory, Columbia University, USA

Guests

D. Goldberg	Lamont-Doherty Earth Observatory, Columbia University, USA
J. Farrell	Joint Oceanographic Institutions, Inc., USA
J. Fox	Ocean Drilling Program, Texas A&M University, USA
H. Fujita	JAMSTEC, Japan
H. Kinoshita	JAMSTEC, Japan
K. Kitazawa	JAMSTEC, Japan
N. Lundberg	Department of Geology, Florida State University, USA (ESSEP Chair-elect)
T. Moore	Department of Geological Sciences, University of Michigan, USA (ESSEP and IPSC Chair)
M. Shinano	JAMSTEC, Japan
S. Takagawa	JAMSTEC, Japan
S. Tanaka	Science and Technology Agency, Japan
J. Tarduno	Department of Earth & Environmental Sciences, University of Rochester, USA (ISSEP Chair)

JOIDES Office, GEOMAR Research Center, Germany

W. Brückmann	Science Coordinator
J. Schuffert	U.S. Liaison
B. Rohr	Administrative Assistant

JOIDES SCIENCE COMMITTEE MEETING

LONG MARINE LABORATORY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

15–18 August 1999

Draft Motions and Consensus Items

SCICOM Consensus 99-2-1
SCICOM approves the meeting agenda.

SCICOM Consensus 99-2-2
SCICOM approves the minutes of the March 1999 SCICOM Meeting.

12 in favor, 1 abstain (Zachos), 2 absent (Bond, Klein).

SCICOM Motion 99-2-3
SCICOM endorses the recommendations forwarded from the June 1999 SciMP meeting.

Moore proposed, Holm seconded; 11 in favor, 4 absent (Bond, Coffin, Robertson, Zachos).

SCICOM Consensus 99-2-4
SCICOM congratulates TAMU on their successful transition to a CD- and web-based publication of the Initial Reports Volume. The first CD and accompanying volume available for Leg 177 is a highly professional production that underlines the quality of the TAMU publications office. In integrating electronic publication with a user-friendly printed summary volume, TAMU publications have set a new standard for electronic scientific publication.

Miller proposed, Moore seconded, passed by acclimation.

SCICOM Consensus 99-2-5
SCICOM approves the proposed chairs, mandates, and membership of the IPSC working groups.

SCICOM Consensus 99-2-6
SCICOM will not rank Proposal 560-Full nor forward it to OPCOM for possible scheduling at this meeting.

SCICOM Motion 99-2-7
SCICOM forwards Proposal 431-Rev to OPCOM without ranking, so as to complete an already highly ranked proposal.

Klein proposed, Wiens seconded, 11 in favor, 1 opposed (Hodell), 1 abstained (Robertson), 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-8
SCICOM forwards Proposal 517-Full to OPCOM for scheduling the second leg of W. Nankai, based on the SSEPs and SCICOM reviews of the scientific plan and contingent upon successful drilling operations during Leg 190 (see SCICOM Motion 98-2-7). SCICOM also encourages the proponents to continue to seek funding to offset the costs of this very expensive leg. SCICOM expects that ODP/TAMU will continue to develop the advanced CORKs and have them completely ready for use by the beginning of the leg. If not, SCICOM views it as critical that the LWD work proceeds as scheduled.

Humphris proposed, Robertson seconded, 13 in favor, 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-9
SCICOM views the timely development and testing of the advanced CORK system as critical to achieving the objectives of drilling at the Nankai accretionary prism. SCICOM therefore instructs OPCOM to work closely with JOI and ODP/TAMU to ensure that development proceeds appropriately. SCICOM also requests that JOI and ODP-TAMU present at the next SCICOM meeting a timeline for development and testing of the advanced CORKs.

Humphris proposed, Srivastava seconded, 13 in favor, 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-10
SCICOM expresses concern about highly ranked proposals (those forwarded to OPCOM) that clearly lie outside the projected area of ship operations for several years yet receive a new global scientific ranking each year. Such proposals inevitably slip in rank because of the higher priority placed on those proposals with a geographic urgency to schedule. SCICOM therefore adopts the following procedure:
1) Every proposal, regardless of its geographic location, will receive a global scientific ranking when first reviewed by SCICOM.
2) If OPCOM does not schedule a highly ranked proposal primarily because it lies outside the projected area of ship operations, SCICOM will not automatically re-rank that proposal the following year. When the possibility arises to schedule such a proposal, SCICOM may request the proponents to submit an update, in the form of either an addendum or a revised proposal (not subjected to further external review), for consideration at the spring meeting of the SSEPs.

Humphris proposed, Klein seconded, 13 in favor, 2 absent (Coffin, Brown).

SCICOM Consensus 99-2-11
SCICOM decides to forward the top ten ranked proposals to OPCOM for possible scheduling. See minutes above (Section G) for a complete list of proposal rankings.

11 in favor, 3 abstained (Hay, Zachos, Brown), 1 absent (Coffin).

SCICOM Motion 99-2-12
SCICOM endorses Yngve Kristoffersen and Jan Backman as candidates for chair or co-chairs of the new Arctic PPG. The chair(s), in consultation with the JOIDES Office, will select the other members of this PPG from among a list of nominees endorsed by SCICOM and from other sources. The membership should reflect the climate focus and other requirements of the PPG mandate (see SCICOM Motion 99-1-5) and include one member with previous experience on the Extreme Climate PPG. SCICOM must approve the final membership.

Miller proposed, Robertson seconded, 14 in favor, 1 absent (Coffin).

SCICOM Motion 99-2-13
SCICOM appoints Shemin Ge as chair of the new Hydrogeology PPG. The chair, in consultation with the JOIDES Office, will select the other members of this PPG from among a list of nominees endorsed by SCICOM. SCICOM must approve the final membership.

Brown proposed, Moore seconded, 13 in favor, 1 abstained (Zachos), 1 absent (Coffin).

SCICOM Motion 99-2-14
Given the importance of the deep biosphere within the Long-Range Plan and the normal 3-year term length of a PPG, SCICOM at its Spring 2000 meeting may institute a new Deep Biosphere PPG (with a revised mandate). Toward this objective, SCICOM invites a representative of the current Deep Biosphere PPG to attend this meeting, present that group's achievements, and suggest future science initiatives in this field.

Robertson proposed, Holm seconded, 14 in favor, 1 absent (Coffin).

SCICOM Motion 99-2-15
SCICOM reaffirms the policy that, when replacing or appointing new JOIDES panel chairs, the appropriate balance between U.S. and other members should be respected as much as possible.

Robertson proposed, Moore seconded, 13 in favor, 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-16
SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

Srivastava proposed, Holm seconded, 11 in favor, 4 absent (Coffin, Hay, Hodell, Zachos).

SCICOM Motion 99-2-17
SCICOM opts to include LWD and advanced CORKs as part of the scheduled science plan for the second leg at W. Nankai (Proposal 517-Full).

Wiens proposed, C. Moore seconded, 12 in favor, 1 abstained (Brown), 2 absent (Coffin, Zachos)

SCICOM Motion 99-2-18
SCICOM will place either Proposal 534-Full or 510-Full3 (ranked 9 and 10, respectively) at the beginning of the drilling schedule for 2000 because the future ship track will most likely preclude the scheduling of these proposed legs during the remainder of the program.

Robertson proposed, Miller seconded, 10 in favor, 2 against (Tamaki, Bond), 1 abstained (Brown), 2 absent (Coffin, Zachos)

SCICOM Motion 99-2-19
SCICOM places Proposal 510-Full3 at the beginning of the drilling schedule for 2000 (see SCICOM Motion 99-2-18).

Srivastava proposed, Robertson seconded, 8 in favor, 2 against (Tamaki, Bond), 3 abstained (Wiens, Moore, Brown), 2 absent (Coffin, Zachos)

SCICOM Motion 99-2-20
SCICOM decides to schedule Proposal 500-Full2 rather than 499-Rev.

Hodell proposed, Humphris seconded, 12 in favor, 1 abstained (Brown), 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-21
SCICOM approves the drilling schedule for 2001 and beyond, as shown below. This schedule could change to take advantage of optimal weather windows, but all projects will be scheduled.

510-Full3	Marion Plateau
431-Rev	W Pacific Network - WP-1
517-Full	Nankai (LWD + CORKs)
523-Full	Hawaii-Emperor Seamounts
546-Full	Hydrate Ridge
500-Full2	H2O Observatory
486-Rev2	Paleogene Equatorial Pacific
465----	SE Pacific Paleoceanography

Humphris proposed, Holm seconded, 10 in favor, 1 opposed (Wiens), 2 abstained (Brown, Tamaki), 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-XX (did not pass)
SCICOM recognizes the importance of completing the high-priority ION sites and thus intends to schedule Proposal 499-Rev during 2000.

Wiens proposed, Holm seconded, 4 in favor, 7 opposed, 2 abstained (Brown, Robertson,), 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-22
SCICOM recognizes the importance of completing the high-priority ION sites and thus intends to schedule Proposal 499-Rev before the end of the current program. SCICOM will forward this proposal to OPCOM for possible scheduling at the August 2000 meeting.

Wiens proposed, Holm seconded, 9 in favor, 2 opposed (Hodell, Tamaki), 3 abstained (Brown, Robertson, Zachos), 1 absent (Coffin).

:ICOM Motion 99-2-23

SCICOM resolves that the *JOIDES Resolution* will operate in the Atlantic Ocean during at least part of 2002.

Moore proposed, Holm seconded, 9 in favor, 1 opposed (Tamaki), 3 abstain (Brown, Robertson, Zachos), 2 absent (Bond, Coffin).

SCICOM Consensus 99-2-24

From the land of the rising sun a new drilling program dawns. The sun sets on Kensaku Tamaki at SCICOM, but rises again over a new InterRidge leader. SCICOM thanks Kensaku for his numerous, significant, and incisive contributions to our deliberations. We know he will remain an important player in marine geosciences, both nationally and internationally, and we look forward to working with him in other future capacities.

SCICOM Consensus 99-2-25

:ICOM thanks Kevin Brown for his long and continuous service that spanned the challenging ansition from PCOM to SCICOM. We appreciate Kevin's keen scientific insights, always offered in a genial style, and his imperturbable nature during tense moments. We wish him well in his scientific endeavors as he retreats from the meeting room to the pleasures of sea-floor seeps and soft mud.

SCICOM Limerick 99-2-26

Ode to Jim Natland (by E. Klein)
The indefatigable Jim,
Heads bow and hats tip off to him.
On matters related
To drilling and data
It's clear we can't function without him.

SCICOM Consensus 99-2-27

:ICOM bids fond farewell to charter OPCOM member Dave Hodell who unhesitatingly jumped into the breech of SCICOM. Dave's perspective, ranging from the ice of the subantarctic to the fire of Florida and Guatemalan lakes will be sorely missed.

SCICOM Consensus 99-2-28

SCICOM bids fond farewell to two long-time PacRim members, Shiri Srivastava and Bob Carter. Shiri has ardently supported ODP since Leg 105, serving as chair of the Site Survey Panel and most recently on SCICOM. Bob has observed the rises and falls of the sea-level issue within ODP, served as a charter OPCOM member, and provided a unique perspective to ODP issues from down under. We will miss them and wish them well as they travel to the antipodes of the PacRim.

SCICOM Consensus 99-2-29
SCICOM expresses gratitude to Susan Humphris, our first chair and guiding light in the intricacies of the new advisory structure. Without her dedication, innovative talents, and discipline, the advisory structure would not have developed into the well-oiled, proposal-nurturing machine we know today. We wish her well in the months until we find a way to make use of her energy and talents in a new capacity! May her service on the USSAC Conceptual Design Committee represent the start of a long and distinguished post-SCICOM career.

SCICOM Consensus 99-2-30
SCICOM congratulates Ted Moore on a job well done as the first chair of the ESSEP, and we wish him well as the first chair of IPSC. His talents as researcher, professor, petroleum geologist, director, guru, soothsayer, and knight in shining armor will all serve him well in this endeavor. May we all live by the motto "In Ted we trust."

SCICOM Consensus 99-2-31
SCICOM takes this opportunity to thank John Tarduno for his service as the chair of ISSEP, though he still has one more meeting. John accepted the position of chair when ISSEP was first created. He has worked extremely hard to ensure that each proposal receives the most thoughtful and fair consideration possible and has taken the nurturing role of the SSEPs very seriously. One of the great successes of the new JOIDES advisory structure has been the synergy between the two SSEPs. This can be attributed to the strong leadership provided by both John and Ted, and will be a legacy to their service. SCICOM acknowledges John's dedication to ODP and the excellent job that he has done as chair of ISSEP. We wish him well in the future and look forward to his continued involvement in ODP.

SCICOM Consensus 99-2-32
SCICOM thanks Casey Moore for a relaxing meeting under the mists and redwood trees of the Santa Cruz Mountains. Being lost in the trees adds a new ambience to the unique beauty of the Santa Cruz campus and our memories of the meeting. We also thank Casey and John Tarduno for leading the field trip, and we thank UCSC and JOI for hosting the social events. As we return to our own institutions, the cover of our Agenda Book will remind us of the hospitality extended by the "banana slug" university.

JOIDES SCIENCE COMMITTEE MEETING

LONG MARINE LABORATORY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

15–18 August 1999

Draft Minutes

Sunday, August 15.....8:30

A. Welcome and Introduction

1. Introduction of SCICOM Members, Liaisons, and Guests

Bill Hay called the meeting to order promptly at 0830 and the participants introduced themselves.

2. Logistics of the Meeting

Casey Moore explained the logistics of the meeting. Gary Griggs, Director of the Marine Science Institute, spoke on behalf of UCSC and described the regional Monterey Bay Marine Science Facilities. Jim Gill, Associate Chancellor of Research, offered greetings as a new member of JOI.

3. Approval of the Agenda

Hay noted that Tom Janecek and Alister Skinner could not attend the meeting. The committee offered no other changes and approved the agenda by consensus.

SCICOM Consensus 99-2-1
SCICOM approves the meeting agenda.

4. Approval of the Minutes of March 1999 SCICOM Meeting

SCICOM Consensus 99-2-2
SCICOM approves the minutes of the March 1999 SCICOM Meeting.

12 in favor, 1 abstain (Zachos), 2 absent (Bond, Klein).

5. Update on Recommendations from March 1999 SCICOM Meeting and EXCOM response

Hay gave a brief update on recommendations from the previous SCICOM meeting, including the status of the PPGs. He noted that the agenda book contained the final revised mandates of the two new PPGs and that EXCOM approved the change in the Terms of Reference that SCICOM had requested at its last meeting. Hay expressed confusion about the meaning of past motions on multi-leg proposals and said that he had not done anything yet about leg synthesis papers by co-chiefs. Ted Moore commented on the ineffectiveness of the Deep Biosphere PPG, but added that we should not disband it entirely. He suggested holding a workshop to involve the broader microbiology community, then have the PPG write a final report. Nils Holm noted that RIDGE and other co-sponsors had held a microbiology workshop two years ago in Washington, D.C., and Hay mentioned a deep biosphere meeting scheduled for next week in Colorado or Utah.

B. Discussion of how to maximize scientific results during remainder of ODP

Hay stressed the importance of discussing how to plan the science program for the remainder of the program. He noted that relatively few legs remained for scheduling. Natland asked how firm the schedule would be at the very end, and Hay guessed that any modification would mean fewer legs. Malfait remarked that this looked like a good way to proceed, although we did not really know the final schedule. Moran asked when JOI would know the target budget for 2003, but Malfait could not give a definite answer. Fox stated that since demobilization would occur in a mutually agreeable U.S. port, this would put a constraint on the end of the program. Hay suggested continuing the discussion by having Moore and Tarduno give the SSEPs perspective, followed by Humphris giving the budget background and a refresher about the thinking behind the prioritization scheme.

Moore showed a diagram of the proposals considered by ESSEP, grouped thematically under the broad categories of fluids, climate, and sea level. He noted that the SSEPs had acted more critically lately when grouping proposals, classifying fewer as Group I than II, perhaps because of technical problems, scientific importance, thematic imbalances, and other reasons. Natland requested and received a definition of the SSEP groupings. Moore stated that we have only two proposals for extreme warm climates, only one for climate-tectonics, and only one for sea level, though he expected to see at least two more sea-level proposals before the program ends. He also noted that the climate-tectonics proposal had arisen from the RFP for a deep hole, which the reviewers did not realize.

Coffin asked whether any LRP themes were missing from the existing proposals, and Moore replied that we had them all covered except perhaps for a specific deep-biosphere proposal other than as an add-on to other studies. Ludden asked whether the committee should know about any other proposals besides those on the list. Moore hesitated to mention other proposals because he did not know for certain what would actually come back in and when, but he said he knew about two more extreme warm climate proposals. Tarduno mentioned that hydrogeology did not appear on the thematic list, but the SSEPs had seen elements of that in a couple of proposals. Miller asked about climate & tectonics, noting that we did not have much to show for the PPG. Moore said that the SSEPs had seen only one proposal along those lines, and although it concerned a good area and a good topic, it had an unconventional style.

Tarduno summarized the ISSEP perspective and explained the ISSEP review process. He reiterated that panel groupings reflected factors other than just science. He thought the panel currently had a low tolerance for risk related to developing technology, scheduling, multi-legs, etc. The panel was looking for "home runs," but these would prove hard to predict when results take five years to mature. Perhaps the most important thing for post-2003 drilling would be to have a few home runs in the remainder of this program. Tarduno showed diagrams of how ISSEP proposals fit into the LRP themes on mantle dynamics, ocean crust, mass balances, deformation of lithosphere, and earthquake processes. He noted that we had no proposals or completed legs for in-situ crust or core complexes, but he thought we had done a generally good job of covering the LRP.

Coffin asked whether any discussion had arisen over the various Nankai proposals. Tarduno replied that some proponents had attempted to link the proposals but only in general terms. Moore noted the distinction between East and West Nankai. Tarduno added that some panel members felt a need for successful drilling first and did not see a clear connection between Nankai and a post-2003 program. Natland recalled that when we first started the SSEPs we wondered how much risk assessment was going on in the old thematic panels. We really need a group of people with

technical expertise to address this issue, and we need to know which proposal groupings this has affected. Tarduno responded that we should not trivialize a message that comes from 30 good scientists. As liaison to ISSEP, Robertson felt that the SSEPs considered the limited number of legs left to schedule and tried to send through the best science.

T. Moore reported that we had a total of seven gas hydrate proposals either now or soon ready for consideration. ESSEP figured that we would drill at least one of these before the program ends, and they identified Proposal 546 (Hydrate Ridge) as the best because it provided a nice mix of activities. Opinions differed on the second best, but most favored Proposal 544 (Gulf of Mexico). Tarduno noted that although the ISSEP mandate did not include gas hydrates, several ISSEP members had an interest and familiarity with this subject. ISSEP identified Proposal 539 (Blake Ridge) as the best because of its simple setting, its global implications, and the potential to understand dynamics. They chose Proposal 546 as second best, but not unanimously. Fox asked why we should pick only the best gas hydrate proposal rather than identify the best package to fully understand the problem. T. Moore replied that the SSEPs saw this as an initial step because they doubted that we could accomplish a full plan. Srivastava asked when the Gas Hydrate PPG would meet again, and T. Moore replied in September.

Humphris outlined the general areas of the LRP where progress had occurred and presented a list of specific goals that we had accomplished and those that we had not. She then placed the accomplishments in the context of the prioritization document and budgetary constraints, saying that we must end the program on a vital note with both science and technology moving forward and poised for further progress in the future. Humphris then presented a list of 16-20 project types that we would ideally need to do. That was clearly too many, so again we really must prioritize the science. She also suggested that the ship should move into the eastern Pacific by the end of 2001.

Robertson asked how new emerging topics fit into the scheme. Humphris sympathized with the problem but emphasized the need for "home runs", saying we should keep in mind the future program. Miller said that in defining a "home run" we should ask whether it represented a world class place to study a particular world class problem. Moran added that some themes, such as ultra-high-resolution climate studies, often required only a few days of ship time. Robertson also inquired about the status of the plan to return to the Atlantic, and Humphris referred to a motion that the ship would return before the end of the program in 2003.

Ludden asked when we would stop accepting proposals. Hay replied that the next March deadline would probably represent the last chance to submit a new proposal with the possibility of scheduling in this program, and it would have to be a perfect proposal. Natland recalled that proposals from the end of DSDP were used at the beginning of ODP, though perhaps not in the best way. He asked whether we could identify projects that would make a good bridge between programs or benefit from more time for technological development. Robertson commented that it was important to know what really important science issues we want to address in the new program. Hay suggested that every committee member identify one important item. Srivastava wanted to clarify whether the non-riser platform would have different capabilities than the JR. Hay noted that Peggy Delaney would report about the Conceptual Design Committee (CDC) for the non-riser ship, and perhaps they could benefit from this discussion.

Coffin believed that since the RFP for deep drilling, SCICOM had not shown much initiative toward this idea and should decide whether to keep pushing it or not. Tarduno added that the SSEPs had discussed the idea of testing the limits of the JR, but they had not received a clear

message as to whether this remained an important issue. Humphris explained that this idea originated from EXCOM, and SCICOM had backed away from it lately because of budgetary constraints. Robertson suggested that it might prove useful to OD-21 for us to continue pursuing this issue, and Hay suggested giving JAMSTEC a chance to think about it and respond later. Natland said that we could not do anything without worthwhile proposals in place, but Wiens believed that if proposals arose only from an RFP then perhaps some of the justification had disappeared. Diebold noted that the community perceived a sense of coyness on the part of the advisory structure regarding this issue.

Srivastava summarized the SSEPs grouping that showed the deep-hole proposal at the bottom of the list, then he listed his personal priorities. Natland cautioned against discussing specific proposals without everyone first admitting conflicts of interest. Hay proposed moving on with general ideas. Coffin felt that we ought to set science priorities and have the broadest possible involvement of the science community, and we ought to move the ship back into different regions of the ocean. In particular we need to get proposals from the deep biosphere and climate-tectonics groups. Zhou favored gas hydrates and active margin processes, while C. Moore would favor plans to round out what we had done in climate, plus the Hawaiian Emperor Seamounts, gas hydrates, and Nankai. Holm felt that we needed a higher rate of hits now than before, but we should not try to complete everything now and leave nothing for the start of the new program. He stated that the LRP is just a plan, not a requirement of what we must complete, but he would like to complete the Southern Ocean paleoceanography. Miller stressed the importance of gas hydrates and of course sea level, and he said that if the Prydz Bay proposal succeeded we might want to return to Antarctica, but the Arctic would provide the biggest "home run." Ludden noted the importance of observatories, thought that we should finish Nankai, and wondered whether we needed a separate biosphere leg. He agreed with Miller about demonstrating the viability of alternate platforms and thought a home run was mantle dynamics/hot spots.

Robertson stated that climatic change might still represent the best topic for helping to fund a new program. We have inadequate data for modeling studies. We might not completely solve everything but could provide a springboard. We also need to do legwork for OD-21 and address gas hydrates. Tamaki wanted to complete the ION sites, begin on the deep biosphere, and continue with climate change. He thought that Humphris had outlined a good start. Hodell presented a priority list of proposals based on the SCICOM environment subcommittee. Brown noted that decadal- to millennial-scale climate change looked very interesting, as well as the deep biosphere, and he definitely favored gas hydrates but had a personal bias toward them. We also need to have a lot of site-survey data for a deep hole in the seismogenic zone. He would like to drill more ION sites but wondered if we really needed them. Wiens did not see the point of a prioritization and checklist of what we had already done in the LRP because we needed to focus on the time remaining. Gaps in the LRP could exist for good reasons, such as no proposals. He did not worry about completing something just for the sake of doing so, but he did see the value of developing new technologies and bringing in new communities for selling the program. Zachos professed a bias to extreme climates and saw decadal- to millennial-scale climate variability as important.

Natland felt that we were leaning toward filling in gaps, rounding things off, and presenting a complete package at the end of the program. Instead, we should think specifically about what we want to accomplish and leave logistics considerations to OPCOM. Hay cautioned that the new program might not have the same partners. Humphris agreed and said that we should of course try to do the best science, but we would inevitably have to show what we had accomplished. Perhaps

this should not serve as a driving factor, but we had to consider it. Hay affirmed that he certainly got this message from the last ODP Council meeting. Natland remarked that all proposals address the LRP. Humphris stressed that we could not just take a random walk through the LRP. Fox stated that we ought to respect the wishes of the Council to see closure on some issues, but without losing sight of science priorities. Srivastava thought that we would stand the best chance of continuing with a new program if we could show clearly that we had completed certain themes. Tarduno believed it would work out, judging from what he had seen so far with the proposals.

C. Reports of Liaisons

1. NSF

Bruce Malfait reported on the membership levels of ODP countries and consortia and the ODP program budget. ESF would increase to 99% full in 2000, but PacRim may decrease because of a reduced input from Taiwan. The NSF/ODP budget was likely to remain level in 2000 and 2001. Malfait also mentioned several U.S. ODP science support awards. NSF received LOIs from U.K., Germany, the European Commission, and China. The IWG support office would be established at JOI. The U.S. had formed a conceptual design committee for a non-riser vessel.

2. ODP Management Report

Kate Moran reported that DOE had given $70K for a new microbiology lab on the JR. Ongoing industry–technology projects included the JAMSTEC/JOI advanced diamond core barrel (ADCB), HYACE, and CONOCO deep-water site investigations. The latter represented a real cooperation with ODP in the lead. Other planned or ongoing industry–science collaborations included another workshop in Houston during October 1999 and the EGI South Atlantic database migration. The latter remained on hold, however, because of uncertainties and volatility in industry support. Moran also said that she would review industry partnership efforts at a meeting of the international ODP program offices at JOI in September.

Moran talked about the success of Leg 185 as part of the deep biosphere initiative. Ludden stated that Leg 185 was a success primarily in terms of biologists and geologists working together, and not because the contamination tests were completely successful. Moran replied that the tests were successfully completed but the results were not all favorable. Humphris inquired whether the new microbiology lab would include space for an isotope lab. Fox answered yes, but they plan to keep the isotope facility separate from the lab stack by adopting the current van as a module for isotopes.

Moran outlined the FY00 Program Plan, noting that it met the target budget and maintained innovation. The ship would operate in the western Pacific and Southern Ocean, with 6 science legs and 1.5 engineering legs. Moran also listed several targets for technology development, including improved core quality, gas hydrates, advanced CORKs, large-diameter logging tools, and hard-rock reentry. C. Moore asked how so many legs fit into one year, and Moran answered that they had variable lengths and one crossed over to the next fiscal year. Coffin stated that the budget for 2000 would be about 4% less and for 2001 about 8% less than what Malfait showed, and he asked how that would impact things. Moran replied that it would fall to OPCOM to decide what to do with high-cost legs. Humphris pointed out that those budgets were calculated several years ago, when we used to have a category for innovation that provided some flexibility for development of new tools.

3. EXCOM

Hay summarized the draft motions from the recent EXCOM meeting in Sydney.

D. Committee and panel reports

1. ESSEP

Ted Moore reported that Neil Lundberg would replace him as chair at the November meeting and Julie Morris would replace Tarduno at the following meeting. He expressed particular concerns about maintaining expertise in hydrology and fluid flow and added that he could see another weakness coming in paleoceanography, especially at longer time scales. Humphris asked whether any effort had gone into putting a microbiologist on ESSEP. Moore answered no, but they had had two members who in general may have proved more valuable than a pure microbiologist. He recognized the importance of microbiology but thought it might prove better to integrate it into other areas like hydrology, etc. Farrell reported that USSAC considered the need for expertise on the deep biosphere and had nominated someone with a geochemistry and microbiology background for ESSEP and a bacteriologist for USSAC. Natland asked whether the mix of things on the SSEPs, the synergy, had worked out. Moore answered yes, partly because Tarduno had kept everyone focused and well organized.

2. ISSEP

Tarduno noted that the panel had approached saturation in terms of different fields and number of members. This meant that they could not add new areas of expertise, such as deep biosphere, to the panel without changing its size or replacing another area that they might still need. Some proposals asked very specific questions that the panel could not adequately address. Miller believed that we needed people with the broadest possible expertise to evaluate proposals, so perhaps it would not prove worthwhile to put a strict microbiologist on the panel.

Hay asked the SSEPs chairs to explain why they wanted to wait until now to give input to SCICOM on proposals. Tarduno answered that they waited primarily because they did not want to submit an official text without giving the proponents a chance to respond to it. Miller said that this did not seem quite fair because some proposals had SSEPs comments and some did not. T. Moore replied that SCICOM had already ranked those proposals once. C. Moore pointed out that he asked for SSEPs comments because he really valued them. Coffin asked whether any proponents had complained about this change in procedure, and Tarduno answered no. T. Moore added that he and Tarduno could provide comments but they would represent only their opinion and not the panel's. Humphris said that SCICOM wanted to see the comments from the panel members about the proposals, not an explanation of the groupings. Moore tried to clarify the difference between the two sets of comments normally provided by the SSEPs

3. TEDCOM

The TEDCOM Chair, Alister Skinner, could not attend the meeting. Hay reported briefly on the TEDCOM meeting in Vancouver. TEDCOM members were very impressed with the science being proposed. They reviewed the current plans for the OD-21 vessel and questioned the need for the proposed double derrick. They urged ODP to replace the seals in the passive heave compensator when installing the active heave compensator during drydock.

4. SCIMP

In the absence of the SciMP Chair, Moran presented the recommendations from the last SciMP meeting. Miller asked why the ship needed to have both conventional and digital photo imaging capabilities. Moran replied that we had to ensure first that we could archive the digital images and provide them to the community before we could stop doing conventional photography. Ludden asked whether ODP would take the XRF off the ship. Fox replied that the long-term strategy called for removing the XRF after addition of the ICP system. Humphris asked about a motion stemming from a previous SciMP recommendation regarding JOI evaluating the overall staffing of ODP. Moran replied that discussions had just started concerning possible changes with science positions on the JR. Fox added that the discussions focused more on how to meet the changing needs of the science community and not so much on changing the total number of positions.

Robertson stressed the importance of having access to the Citation Database. Coffin suggested that the committee should reconsider the SciMP recommendation on Preliminary Reports and let them stay in the gray area rather than make them more official. Robertson agreed because the Preliminary Reports often contained mistakes that remained uncorrected for months or even permanently. Hay noted that once something appears on the Web, everyone generally regards it as published. Miller suggested establishing a moratorium of say two months before the reports go on the Web. Coffin noted that many options existed and proposed discussing it later. In a related sense, Ball suggested that the JOIDES Office could distribute the Drilling Prospectus on CD-ROM, and Hay concurred. Ludden thought the committee should follow up on an earlier email from one member and commend TAMU for the success of the new electronic publication format.

SCICOM Motion 99-2-3
SCICOM endorses the recommendations forwarded from the June 1999 SciMP meeting.

Moore proposed, Holm seconded; 11 in favor, 4 absent (Bond, Coffin, Robertson, Zachos).

SCICOM Consensus 99-2-4
SCICOM congratulates TAMU on their successful transition to a CD- and web-based publication of the Initial Reports Volume. The first CD and accompanying volume available for Leg 177 is a highly professional production that underlines the quality of the TAMU publications office. In integrating electronic publication with a user-friendly printed summary volume, TAMU publications have set a new standard for electronic scientific publication.

Miller proposed, Moore seconded, passed by acclimation.

5. SSP

John Diebold summarized the proceedings of the last SSP meeting. He announced that Al Hine would serve as SSP liaison to the next ESSEP meeting and Michael Enachescu would do the same for ISSEP. SSP had also suggested three people to replace Gail Christenson. Diebold also outlined the availability of seismic data for various proposals and commented on the often very poor quality of the data received, wishing they could get more digital navigation data with information on site location. Ball asked whether one could realistically say that a proposal scoring lower than 2 on their scale could get ready for scheduling before 2001 and Diebold replied no.

6. PPSP

Mahlon Ball stated that if SCICOM scheduled six legs for drilling in 2001, they would meet the request of the PPSP. Srivastava asked when the PPSP would hold its next meeting, and Ball replied that it would occur in December before AGU.

E. Report on IPSC

Ted Moore listed all IPSC activities since its March inception as well as those planned through December 1999, including the next IPSC meeting in October. He commended the efforts of Tom Janecek and SciMP in providing input to JAMSTEC on OD-21 shipboard facilities. Moore gave a tentative outline of a long-range science plan and said that he expected to have a first draft ready for editorial review by December. Hay asked whether IPSC wanted input from SCICOM on the long-range-plan. Ludden suggested calling it a ten-year plan rather than a long-range plan. Tarduno hoped that it would remain a flexible document. Moore replied that IPSC intended to address the science plan from a priority standpoint, and they would like to get volunteers from SCICOM to review it. He added that we should also start thinking about the transition from this program to the next one. For example, although we did not know when drilling would begin, we should continue to evaluate proposals that would remain in the system and provide feedback to proponents.

Moore then presented mandates for the Science Plan, Industrial Liaison, and Technical Advice Working Groups and listed their potential membership. He requested approval from SCICOM for the proposed mandates and attributed the slow progress on establishing these groups primarily to the current uncertainties in industry. Moore also presented a series of flowcharts outlining various options for the science advisory and management structures. One option showed a science advisory structure similar to the current one, except with an independent engineering subcontractor for technology development, whereas another option showed separate riser and non-riser science committees. Miller asked why IPSC had not established a working group for a non-riser ship, and Moore answered that he expected the CDC to take care of that. Humphris hoped that IPSC would look at other models for handling multi-directional programs and address the question of how to do science in a multi-platform program. Moore stated that we would need two shore-based labs if not a full lab on the ships. He also explained that his community survey had shown a strong preference (69-11) for the full vs. limited option of staffing and equipping the riser ship for science operations. Brown asked how we would find enough scientists to participate on a 3-5 year leg, and Moore acknowledged the potential difficulty. Carter suggested that we would need stronger involvement of graduate students. Miller asked what kinds of measurements we had to consider. Humphris said that we could do the minimum necessary for safety, ephemeral properties, and decision making. Ludden added that all good geochemistry could only happen in a shore-based lab.

Natland asked about the project management for long-term riser legs and about the technical and logistical difficulties of drilling the seismogenic zone. Moore replied that he would expect every riser leg to have its own DPG, and they would most likely have to tailor the plan to individual parts of a given leg. Brown explained that the SEIZE DPG had considered many of these issues, but it would help to have lots more information on seismicity, heat flow, etc. C. Moore suggested that a DPG should exist by now to select a site for the first riser leg. Moran suggested that SCICOM identify what problems would exist for scheduling riser legs using a structure similar to the present one. Humphris noted that the new program would most likely have a different structure than the current one because of the greater complexity and expense of site surveys for riser drilling, and she wondered whether the new program would have a separate operator for site surveys. Natland

agreed that at some level the project would have to include surveying. Diebold emphasized the much greater expense of the 3-D surveys needed for riser drilling compared to current site surveys, and Moore added that no one could get 3-D surveys funded for an area without a good scientific reason to drill there. Coffin mentioned an ongoing effort in the U.K. to get a survey vessel on a long-term charter and asked where the site-survey issue fit within IPSC planning so far. Moore replied that it did not yet fit, but he hoped to establish a liaison with industry to address this issue. Humphris asked whether a timetable existed yet for meshing finances with hopes and expectations, and Moore said not yet. Purdy stated that the process would occur continuously through 2002.

See Section H below for further comments on the IPSC working groups.

SCICOM Consensus 99-2-5
SCICOM approves the proposed chairs, mandates, and membership of the IPSC working groups.

Monday, August 16 ..... 8:30

Joint Meeting of SCICOM and OPCOM (continued)

F. Presentation and discussion of drilling proposals

SCICOM decided by straw vote that proponents must leave the room for the entire presentation and discussion of their own proposal. Wiens asked whether the SSEPs would provide more input on the proposals. Hay answered yes and announced that he wanted to group the proposal presentations according to the themes presented yesterday by the SSEPs chairs. He asked the SCICOM watchdogs to identify the most important kernel of science in each proposal. Hay proposed to have a 10-minute presentation of each proposal, followed by 5 minutes of comment from the SSEPs chairs, 15 minutes of general discussion, and a brief wrap-up of the theme.

1. Mantle Dynamics

431-Rev W. Pacific (Wiens)

499-Rev ION Equatorial Pacific (Wiens)

These two proposals represent components of the ION seismometer emplacement program. Natland noted the importance of having a clean clamping connection in the borehole and suggested that this might prove difficult to achieve at the eastern Pacific sites with poor host rock conditions. Fox noted that this problem would not matter when cementing the instruments in place, as done on Leg 186. Wiens affirmed that the holes in the eastern Pacific would be cased and prepared for permanent seismometer emplacement. Klein asked why the areas planned for seismometer emplacement all lay in the northern hemisphere when others generally recognized the sparse nature of the seismic net in the southern hemisphere as a major problem. Wiens noted that the proponents viewed these sites as essential to the initial development of the system and had avoided the less accessible parts of the ocean for the immediate future. Hay asked whether any proposals for Southern Hemisphere sites had entered the review system. Tarduno advised that the three proposals in the current prospectus represent the only ones in the system.

500-Full2 H2O Long-Term Seafloor Observatory (Tamaki)

Natland, a co-proponent, left the room during the presentation and discussion of this proposal. The original proposal called for a seismometer emplacement to take advantage of a disused cable

connection between the mainland and Hawaii. JOIDES had asked the proponents to consider expanding the science by also investigating the ocean crust. Much of the discussion centered on whether the additional crustal investigation, added at JOIDES request, merited the additional time involved. Additional information on the crust would be gained by deepening the basement penetration. Ludden noted that we had drilled 400 meters of fast spreading crust on Leg 185. He urged that a proper crustal study should include a transect of holes, not just a single hole on 40 Ma crust. Brown questioned whether the crustal study in a single hole might yield useful information on the nature of active hydrologic flow in the system. The committee agreed by consensus not to consider the crustal investigation when voting on the proposal.

The discussion then turned to the seafloor observatory proper. A seafloor seismometer had already been buried at this locality and worked for some time, until it developed a leak. Wiens showed data demonstrating that borehole emplacement offers a definite advantage in receiving a clearer signal. There are several experiments to be done in addition to the emplacement of the seismometer. Only one hole is to be drilled, and it must penetrate deeply enough into basement to ensure that it will produce a good long-period record. The other experiments are to be carried out on the seafloor, not in the hole. Hodell inquired whether the seismometer installation and other experiments would require less time than a normal leg, and Baldauf answered yes. Humphris noted that SCICOM had previously ranked all three mantle-dynamics proposals in the top ten.

2. Gas Hydrates

355-Full7 Peru Margin (Moore)

Brown, a co-proponent, left the room during the presentation and discussion of this proposal. Moore noted that the proposal had been in the system for some time. It places the study of gas hydrates in a dynamic tectonic framework. Holm noted that the latest version had strong microbiology and molecular biological components.

546-Full Hydrate Ridge (Holm)

Holm explained that this proposal involved three drill sites, estimated to comprise only half a normal leg. Humphris noted that the proponents might have underestimated the leg length. Srivastava questioned the need for two sites, saying that HR3 looked very similar to HR1 and much simpler to drill. Moore explained that the proponents claimed to see a double BSR at HR1 and that gas was escaping from the surface there.

553-Full Cascadia Margin (Holm)

Holm led the discussion of this proposal. He noted that one reviewer had suggested combining Cascadia Margin with Hydrate Ridge, but another reviewer had urged not to combine them.

A general discussion of gas hydrate proposals ensued. Natland asked about the CORK investments requested for these proposals. Moore replied that two CORKs were proposed for Cascadia, one implied for later installation at Hydrate Ridge, and none for the Peru Margin. The discussion then ranged to consider these proposals in the context of all of the gas hydrate proposals in the system. Moran reminded SCICOM that they needed to consider the proposals individually. SCICOM regretted that the Gas Hydrates PPG had not prioritized these proposals. The PPG had emphasized the need to investigate extreme types of hydrate accumulation. It was noted that Blake Ridge is a very simple system, and the conditions become increasing complex in the Gulf of Mexico

and on the active margins. The Norwegian margin will be of special interest because of the potential relation between gas hydrates and slope failure. It was questioned whether studies on active margins would contribute much to one of the major objectives, estimating the global volumes of gas hydrates. Srivastava asked why so little effort was devoted to determining flow rates. C. Moore replied that Cascadia planned to use advanced CORKs and would get flow rates. T. Moore reported that ESSEP favored Hydrate Ridge because it proposed to calibrate gas volumes to seismic signals. C. Moore preferred the Cascadia Margin because he felt it would be possible to quantify the amounts of hydrate present and to evaluate their occurrence in a broader context. The question was raised whether we should hold off on scheduling any of the gas hydrate proposals until we had a better understanding of the entire spectrum of gas hydrate proposals in the system. The consensus was that we should consider those in the prospectus for scheduling in 2001.

3. Fluids

478-Full4 Eastern Nankai (Brown)

Wiens noted that the available seismic data have not clearly defined the decollement, an important aspect of the proposed objectives. Tarduno stated that ISSEP did not feel satisfied with the quality of the seismic data, and that these were essential to define faulting at these depths. Brown noted that a planned 3-D Site Survey in 2000 should contribute much new information. It was noted that this work might have a bearing on the location of the OD-21 Seismogenic Zone investigation. The SEIZE DPG had not designated a specific site, but would certainly consider this area. Ludden asked whether SCICOM could evaluate parts A and B of the proposal separately. Tarduno noted that the connections between the two sets of sites were not well developed. Wiens inquired why ISSEP had classified Part B as "IV" – Tarduno replied that it was because of the poor seismic coverage. Wiens noted that Part B might be more interesting, but is being downgraded because of the poor imaging available at present. SCICOM decided to vote separately on Part A and Part B.

517-Full Nankai Trough (Humphris)

Humphris reminded SCICOM that the first part of this proposal (Leg 190) had received top ranking. She referred to SCICOM Motion 98-2-7 pertaining to this project. It was a question of whether to split it into two short legs rather than one long one, and this was an OPCOM issue. Robertson noted that LWD on the second leg was essential to get the full value from the results of the first leg. Others agreed that it was essential to get the LWD data. T Moore reported that ESSEP had looked on this program as analogous to ANTOSTRAT, in that one leg was approved but not yet drilled and involved using expensive unproven technology. Humphris responded that the comparison with ANTOSTRAT was not appropriate because SCICOM had agreed from the beginning that a two-leg program was needed to accomplish a single set of objectives. Tarduno reported that ISSEP had classified the second leg as "IV" because we needed more information that would only become available after the first leg was completed.

Concern was also expressed over whether the CORKs needed for the second leg would be available in time. Humphris responded that all of the pieces needed for the advanced CORKs are available in industry, and it is just a matter of modification for use on the JR. OPCOM should track the development to ensure they can be deployed as planned. Moran noted that the SSEPs were asked to make an evaluation of the technical information, and that evaluation should be available to the committee. She noted that the biggest risk was emplacement and casing, and that TAMU engineers thought that was under control. Tarduno replied that "technical review" was the right wording, but

the important message was that the technology be delivered on time, and that that was an OPCOM issue. Brown argued for preserving the LWD portion of the leg regardless of the advanced CORKs development. Hay noted that it is not possible to wait for the results of the first leg to schedule the second or else it would be too late, but we could always cancel the second leg if the first one proves disastrous.

505-Full3 Mariana Convergent Margin (Humphris)

Humphris reported that this proposal focused on processes in the down-going slab. It had received favorable reviews although it was not particularly well organized. It also had a strong biological component but perhaps with too much emphasis on the origin of life. Robertson emphasized the unique opportunity to investigate the deeper part of the subduction zone, the close tie with continental geology, and noted that it would generate interest beyond the marine community. Klein noted that the proposal is interesting in terms of mud volcanoes, but that she was not convinced that it would be possible to look at fluids from different depths because the plumbing system was not necessarily vertical. Humphris responded that it might not be as simple as presented, but that if they recovered good suites of metamorphic minerals it would be possible to put constraints on temperatures and pressures. C. Moore inquired how we would know that the fluids were coming from the slab. Klein noted ^{10}Be would provide a certain clue. Tarduno noted that ISSEP had classified it as a "I" because of its complementary nature to other studies of mass balance. There was some concern that the available seismics do not resolve the structure of the mud volcanoes and their surroundings.

4. Extreme Climates

482-Full2 Wilkes Land (Miller)

Miller noted that a letter from Carlota Escutia informed SCICOM that Proposal 482 (Wilkes Land) is being revised. It was again noted that Wilkes Land offers a unique opportunity to trace seismic reflectors from the shelf into the deep sea.

489-Full2 Ross Sea (Miller)

This revised proposal now concentrates effort on the eastern basin of the Ross Sea and focuses sharply on investigating the history of the West Antarctic ice sheet, with one site targeting the older history. C. Moore inquired about the success of the results of the Cape Roberts drilling on the shelf and its implications for drilling with the JR. Miller noted that it was very successful in recovering different sediment types, but that there was no problem with heave in drilling from the ice.

503-Full2 Weddell Sea (Miller)

This proposal combines two earlier proposals that originally had two different objectives: history of the western sector of the East Antarctic ice sheet, and the Cretaceous history of Antarctica. All drilling would occur on the rise, none on the shelf.

In a general discussion of the three ANTOSTRAT proposals, it was noted that Wilkes Land would use the same drilling strategy as Prydz Bay, but that Ross Sea would use a very different strategy. With regard to possible iceboat support, Hay noted that the Polarstern would operate in the Weddell Sea in 2002, and discussions had begun between the proponents and Antarctic research

groups concerning operations in the Ross Sea and Wilkes Land areas in 2001. Moran cautioned that we do not really know anything yet about iceboats.

486-Rev2 Paleogene Equatorial Pacific (Zachos)

T. Moore, a co-proponent, left the room during the presentation and discussion of this proposal. Zachos described it as a timely, high-priority problem in an ideal location, proposed by highly qualified proponents and with an excellent chance of success. The scientific goals concern the warm climate of the Eocene. The proposed transect would define the position of the ITCZ, equatorial productivity, and detailed climate evolution during the Eocene. Several members noted that SCICOM had seen this proposal before and ranked it highly, but it did not lie close to the proposed drilling tracks. It was also noted that the proposed study constitutes about a leg and a half. Moran inquired whether we could achieve the high-priority goals if we reduced it to a standard leg. Zachos tried to select four sites for removal, but the need for a transect across the paleo-equators would make it hard to capture with fewer sites. Others agreed that it might be difficult to locate the paleo-equator with fewer sites. Hay stated that he thought it would require the proponents to answer Moran's question.

534-Full Shatsky Rise (Miller)

Zachos, a co-proponent, left the room during the presentation and discussion of this proposal. Miller reported that the chief concern here lies with the recovery of chert sections. Moore noted that ESSEP had split down the middle between "I" and "II" on this proposal. He was not sure what problems those who classified it "II" perceived. He noted that it would be very interesting to constrain the position and thickness of the oxygen minimum zone in the Pacific during the Paleogene and Cretaceous. Tarduno noted that ISSEP had classified it as "III" but hoped to get some information on a small LIP through a short basement penetration. Hodell noted that the real strength at Shatsky was the Cretaceous record. Miller called attention to Roger Larson's communication regarding success in drilling older sediments in the Pacific. Much of the success may depend on the effectiveness of the active heave compensator to be installed during drydock, and on the advance diamond core barrel (ADCB).

5. Mass Balances

451-Full5 Tonga Forearc (Robertson)

Robertson noted that this project would be of great interest to continental geologists as a modern analog. Brown noted that it might help answer the important question of how the Oman ophiolite and similar sequences became obducted. Tarduno noted that this proposal has had a long history and that the proponents had responded well to the panel's comments. Humphris expressed concern that the original proposal had two themes, one major and one minor. The minor theme had now become the major and vice versa, but the drilling strategy had not changed. Robertson replied that the proponents felt that the original strategy was adequate to address both themes and the original focus was still important. The key was the north-south temporal evolution of the arc. Brown asked if 100 m of basement penetration was enough to gain insight on arc evolution. Robertson answered that the proponents believe so.

F. Presentation and discussion of drilling proposals (continued)

6. Sea Level

510-Full3 Marion Plateau (Hodell)

Miller noted that this proposal offered a good strategy for determining the absolute magnitude of sea level changes. It will yield good amplitude estimates, and will be an effective evaluation of sequence architecture. Carter noted that this is a unique situation and opportunity to investigate the amplitude problem that can not be done anywhere else in the world. It is an excellent example of a problem that can not be solved by any method other than drilling. T. Moore noted that one or two other sea-level proposals might be seen by SCICOM before the end of the program, but the proponents have done an excellent job, and the seismic data are superb. It was also noted that this would yield important new information on the development of carbonate platforms.

7. Past Mantle Flow

523-Full Hawaii-Emperor Seamounts (Robertson)

Tarduno, a co-proponent, left the room during the presentation and discussion of this proposal. This proposal has been very well received by ISSEP. C. Moore noted that this study would have an impact on paleoclimate studies because it would better determine the orientation of the paleoequator in the Pacific. He expressed concern about the lack of seismic data in the proposal. Diebold noted that data should be available for all sites, although it is not yet all in the data bank. T. Moore stated that ESSEP is aware of the paleoceanographic implications of this proposal because it involves reconstruction of plate motion for a critical time interval. Lundberg added that he would feel dismayed if SCICOM regarded the ESSEP classification as "III" to be a negative opinion. Tamaki observed that the proposed hotspot drift rates are too high for mantle convection. Robertson noted that the estimates come from extremely limited data with large error bars. Ludden said that he would like to see a petrologist on the proposal because of the hardrock recovery that will be achieved. Wiens asked whether the new data would enable a distinction between hotspot drift and true polar wander. Robertson replied that the new data would have error bars, but that hopefully they would not be large. Natland expressed concern about potential problems with the bottom hole assembly twisting off during the basement penetrations. He added that volcanoes take a long time to build and their chemistry changes so it will be important to know what kind of rocks are going to be drilled.

8. Climate

521-Full4 Indus Fan (Hodell)

Hodell reminded SCOCOM that this proposal represented a response to the RFP for a deep hole. It is intended to date the uplift of Tibet and the western Himalaya through fission track studies of single crystals recovered from the sediment. Tarduno reported that ISSEP was originally very excited about this proposal, but classified it as "IV" because the site location was not well characterized. The proponents had originally proposed to drill through the entire fan, but the review was very critical of this. Now they plan to bottom in the Miocene, but this would still fit the interest of climate modelers. The proponent's response letter (PRL) did not answer one reviewer's question and the panel would still like to see an explanation. Brückmann noted that the

proponent was at sea when he had to prepare the PRL and may not have had access to the necessary data.

Srivastava asked whether this was the best place to study this problem. T. Moore said that if you wanted to get at the unroofing history you would have to look proximally. Humphris asked where we stood in understanding Tibet and Himalayan uplift after the E Asian Monsoon and Bengal Fan legs. These legs had provided information on the eastern part of the region, but the western areas have had a different history. Robertson replied that single crystal studies would be most important in this was the area, but siting is critical. Miller asked if the study could be done with cuttings from industry wells. Hay noted that a recent synthesis of the sedimentary mass balance of southeastern Asia (Metivier et al., 1999) used industry data and assumed an industry-determined stratigraphy for the Bengal and Indus fans that differs from that of DSDP and ODP. T. Moore noted that it is difficult to carry the seismic data from basin to shelf. To determine sedimentation rates in the proposed hole it would be important to know how it fits into the package of fan deposition, but this could probably be done after the drilling. Ludden pointed out that there will be a competing Bengal fan proposal and asked which location was better, but then it was recalled that the two areas have different histories. Natland inquired how deep the hole would have to be below that proposed to define the history of the drainage system. Tarduno replied that it would need to be 1500 m deep. Miller asked why this proposal came to SCICOM when it has a classification of "IV" from both SSEPs, and it was recalled that all proposals that go out for external review are automatically forwarded on the SCICOM.

Humphris suggested that we could decide not to rank this proposal. T. Moore stated that he would prefer to see SCICOM rank the proposal especially in view of the fact that it was submitted in response to the RFP. Hay stated that one option was not to rank it, and then to write to the proponents and stress the need for better site information and justification. Miller expressed concern that the proposal was not ready for drilling, and Srivastava agreed.

465----- SE Pacific Paleoceanography (Miller)

Miller noted that the rationale for the proposed study included both longitudinal and depth transects. It would essentially require two legs in its present form, but the two legs would not necessarily need to be consecutive. T. Moore noted that it would be unfortunate to miss the older part of the stratigraphic section because of its integral nature to understanding the paleoceanographic development of the Pacific. Bond agreed about the importance of this project because we know so little about the southeast Pacific sector of the Southern Hemisphere gyre.

477-Full2 Okhotsk and Bering Seas (Bond)

This proposal concerns the history of the Okhotsk and Bering Seas. Bond noted that this is an important area because of its potential as a source of intermediate or deep waters, but that its history remains largely unknown. There may be too many sites proposed, and it is a region of high sedimentation rates. The proposal contained inadequate discussion of how the sediments would be dated or how proxies would be used to interpret paleoenvironmental conditions, and especially how they would investigate the ice-rafted detritus (IRD) and determine the source areas. Miller expressed concern that the seismics seem to show unconformities suggesting that the record may contain a number of hiatuses. The proposal needs another revision to address these concerns, but he expressed hope that it could be drilled before the end of the program.

T. Moore noted that the ESSEP endorsed the reviewer's comments and the proponents' response. Bond was impressed by the detail of the response. Brown suggested that perhaps we might do a pilot study at one site to determine whether the sediments look the way we expect them to. Baldauf inquired how SCICOM would prioritize the three main objectives. Bond stated that he would put IRD last and the gateway aspect first, but that a depth transect would be needed. Hodell suggested that the proponents might be attempting to do too much, and they might better concentrate the drilling plan on understanding the Sea of Okhotsk as a source of intermediate water and extend the study beyond the Sea proper.

455-Rev3 Laurentide Ice Sheet Outlets (Bond)

This proposal addresses the problem of Laurentide Ice Sheet Outlets. Bond questioned why we had to keep re-ranking proposals like this that lay far from any possible ship track for the next year. Humphris noted that the ranking of this proposal had dropped from 4 to 9 over the past two years, not for science reasons, but because other proposals for drilling in the Pacific had been ranked higher. Miller noted that there is a risk in not re-evaluating proposals because science moves forward and the relevance of a project may change. As it stands the proposal does not represent the latest science, and it would be useful if the proponents would revise the proposal as the ship track approaches the area. Humphris noted that we had asked them to do that after the August 1998 meeting. Diebold noted that the proponents had been very responsive in providing site survey information.

Humphris noted that she would like to avoid ranking proposals that cannot get on the schedule, but then we lose the global aspect of the science ranking. Wiens asked if we might exclude them based on area. Humphris added that she would only exclude those that SCICOM had already ranked once.

549-Full Arabian Sea OMZ (Zachos)

This proposal addresses the history of the oxygen minimum zone in the Arabian Sea. T. Moore noted that ESSEP classified it "I" and regarded it as very interesting. Bond agreed with the importance of this region in documenting millennial-scale variability outside the North Atlantic, and noted that the proponents have excellent reputations.

9. Ocean Crust

525-Full Mid-Atlantic Ridge Peridotite (Srivastava)

This study will investigate peridotites along the Mid-Atlantic Ridge. Klein characterized it as an elegant and exciting proposal. Tarduno noted that ISSEP classified it "I" and had received a clear message from the external reviewers that they considered it high-priority science. Natland noted that the success of the project would depend on the ability to spud-in on bare rock. He also noted the uniqueness of the study area for investigating mantle peridotites. Tamaki felt sure that this study would provide a better understanding of a slow-spreading ridge system. He also noted that he had rarely if ever seen better reviews.

535-Full2 735 Deep--Slow Spreading Ridge (Klein)

Natland, a co-proponent, left the room during the presentation and discussion of this proposal. Klein stated that the project could be accomplished successfully, and would be a major achievement

before the end of the program. Klein noted that we have yet to see the later gabbros and primitive cumulates found in ophiolites. Brown asked how important the exact contact was, and was there likelihood that the contact at the proposed site might be tectonic, possibly a detachment fault. Tarduno noted that this is a fundamental uncertainty in this proposal. ISSEP had classified it "I-II" in part because of this risk. He expected that the proponents would argue that it is important to sample the contact even if it differs from what they expect because it may be representative of a large area. Ludden stated that he expected the contact would be mylonite on a slow spreading ridge. Wiens asked why the contact must be drilled if it is exposed on the surface. Klein replied that drilling was required to provide unaltered samples. Brown asked whether they could move the drill site towards the surface exposure and decrease the depth of penetration required. Klein replied that the proponents want to log the lower 1500 m as close as possible to Hole 735B. Tarduno reminded SCICOM that this is a two-leg project and SCICOM should consider whether they want to make this great a commitment before the end of the program.

10. Tectonics

560-Full Woodlark Basin (Robertson)

SCICOM agreed by consensus to discuss this proposal although it had not gone through the entire review process. SCICOM made this exception to the rules because the Leg 180 Woodlark Basin drilling through the detachment fault had been terminated by safety concerns based on shipboard interpretation of hydrocarbon data. Subsequent analysis of the data suggested that drilling could have proceeded. The exceptional potential importance of this proposal is that it would complete one of the major tectonic objectives outlined in the Long-Range Plan, and if not included in the 2001 schedule it is highly unlikely that the JR would return to this area before the end of the program. The discussion was held with the understanding that it did not imply that SCICOM must include the proposal in its ranking. Robertson, who had sailed on Leg 180, led the discussion. (The possible conflict of interest stemming from the fact that Brian Taylor had submitted the proposal "on behalf of the Shipboard Scientific Party" was discounted because Robertson had neither seen the proposal beforehand nor would he agree to act as a co-proponent).

Srivastava asked about the plans for additional seismic work. Robertson stated that they would only do a little more with the JR. Zhou asked whether the proposed study would make a link between continental and oceanic rocks. Robertson affirmed that possibility. Tarduno noted that ISSEP had decided to send the proposal out for external review, but that the panel wanted to see the reviews because they wanted reassurance about the safety issue. A consensus emerged that the safety issue remained a strong concern and that the committee needed more information before they could consider this proposal for scheduling.

SCICOM Consensus 99-2-6
SCICOM will not rank Proposal 560-Full nor forward it to OPCOM for possible scheduling at this meeting.

G. SCICOM Vote on scientific ranking

Wiens asked why SCICOM had to rank Proposal 431-Rev again based on past decisions regarding this proposal, and he wondered whether this had ever happened before. Tamaki noted that funds had already been committed to developing the instruments. Robertson thought SCICOM should

just go ahead and rank it. Hodell asked how OPCOM could judge the relative merits of an unranked proposal compared to the ranked ones.

SCICOM Motion 99-2-7
SCICOM forwards Proposal 431-Rev to OPCOM without ranking, so as to complete an already highly ranked proposal.

Klein proposed, Wiens seconded, 11 in favor, 1 opposed (Hodell), 1 abstained (Robertson), 2 absent (Coffin, Zachos).

Klein still had concerns about the cost of CORKs on Proposal 517-Full. Moran noted that OPCOM should know why SCICOM wanted to separate LWD and CORKs. Miller did not want to separate them and wanted to see it scheduled even if it included only LWD and not CORKs. Hodell again expressed concern about how OPCOM would consider these unranked proposals. Tarduno hoped that any decision to proceed with the second Nankai leg would not preempt comments by the SSEPs on the results of the first leg.

SCICOM Motion 99-2-8
SCICOM forwards Proposal 517-Full to OPCOM for scheduling the second leg of W. Nankai, based on the SSEPs and SCICOM reviews of the scientific plan and contingent upon successful drilling operations during Leg 190 (see SCICOM Motion 98-2-7). SCICOM also encourages the proponents to continue to seek funding to offset the costs of this very expensive leg. SCICOM expects that ODP/TAMU will continue to develop the advanced CORKs and have them completely ready for use by the beginning of the leg. If not, SCICOM views it as critical that the LWD work proceeds as scheduled.

Humphris proposed, Robertson seconded, 13 in favor, 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-9
SCICOM views the timely development and testing of the advanced CORK system as critical to achieving the objectives of drilling at the Nankai accretionary prism. SCICOM therefore instructs OPCOM to work closely with JOI and ODP/TAMU to ensure that development proceeds appropriately. SCICOM also requests that JOI and ODP-TAMU present at the next SCICOM meeting a timeline for development and testing of the advanced CORKs.

Humphris proposed, Srivastava seconded, 13 in favor, 2 absent (Coffin, Zachos).

SCICOM then addressed the issue of how to handle highly ranked proposals that remain unscheduled primarily for geographic reasons. Miller stressed the need to state that such proposals would not go out for re-review, and Lundberg requested allowing the SSEPS to have a second look.

SCICOM Motion 99-2-10
SCICOM expresses concern about highly ranked proposals (those forwarded to OPCOM) that clearly lie outside the projected area of ship operations for several years yet receive a new global scientific ranking each year. Such proposals inevitably slip in rank because of the higher priority placed on those proposals with a geographic urgency to schedule. SCICOM therefore adopts the following procedure:
1) Every proposal, regardless of its geographic location, will receive a global scientific ranking when first reviewed by SCICOM.
2) If OPCOM does not schedule a highly ranked proposal primarily because it lies outside the projected area of ship operations, SCICOM will not automatically re-rank that proposal the following year. When the possibility arises to schedule such a proposal, SCICOM may request the proponents to submit an update, in the form of either an addendum or a revised proposal (not subjected to further external review), for consideration at the spring meeting of the SSEPs.

Humphris proposed, Klein seconded, 13 in favor, 2 absent (Coffin, Brown).

SCICOM members voted by closed ballot to establish a global scientific ranking of 19 proposals, as summarized below. Farrell and Fox tallied the votes.

Rank	Proposal	Title	Mean	Std. dev.
1.	523-Full	Hawaii-Emperor Seamounts	6.2	4.8
2.	465-----	SE Pacific Paleoceanography	6.3	4.2
3.	486-Rev2	Paleogene Equatorial Pacific	6.4	3.5
4.	525-Full	Mid-Atlantic Ridge Peridotite	6.4	3.5
5.	500-Full2	H2O Long-Term Seafloor Observatory	7.0	5.0
6.	499-Rev	ION Equatorial Pacific	7.5	5.2
7.	546-Full	Hydrate Ridge	8.3	4.8
8.	505-Full3	Mariana Convergent Margin	8.6	5.0
9.	534-Full	Shatsky Rise	8.8	3.6
10.	510-Full3	Marion Plateau	9.2	5.5
11.	489-Full2	Ross Sea	9.9	4.5
12.	553-Full	Cascadia Margin	10.4	4.8
13.	451-Full5	Tonga Forearc	11.4	5.2
14.	535-Full2	735 Deep--Slow Spreading Ridge	12.6	6.2
15.	477-Full2	Okhotsk and Bering Seas	12.8	5.8
16.	549-Full	Arabian Sea OMZ	12.9	4.3
17.	478-Full4	Eastern Nankai (Part A)	13.2	4.9
18.	478-Full4	Eastern Nankai (Part B)	15.3	4.7
19.	355-Full7	Peru Margin	16.5	2.6

SCICOM then deliberated on how many of the ranked proposals to forward to OPCOM for possible scheduling. Miller suggested drawing the line above Proposal 489 because that proposal and the one below it could both benefit greatly from a revision. Lundberg noted that any proposals requiring external review would have to arrive by the October deadline to make it into the program. Carter hoped that this would not eliminate all chances for the Antarctic proposals. Miller replied that the proponents of Proposal 489 already had a rewrite in the works.

SCICOM Consensus 99-2-11
SCICOM decides to forward the top ten ranked proposals to OPCOM for possible scheduling. See minutes above (Section G) for a complete list of proposal rankings.

11 in favor, 3 abstained (Hay, Zachos, Brown), 1 absent (Coffin).

Ludden noted that all proposals ranked above the line had U.S. lead proponents. He suggested that perhaps the process should change so that all proposals would have to involve proponents from several countries. Robertson said that one could see how this might happen from the nature of the science, and it could create a problem for some funding agencies. He believed that many projects could benefit with greater international involvement from the beginning. He would not favor quotas but perhaps guidelines. Malfait explained that JOIDES had looked at this issue in the past and found that the proponents roughly reflected the proportion of resources put in. Ludden said that a different perception existed now, but Malfait suggested that this might depend on the ship track.

SCICOM Subcommittee

H. Comments on IPSC Working Groups

Moore again showed the mandate and the proposed membership of the Science-Plan Working Group and asked SCICOM for any new names. He wanted John Armentrout to chair the Industrial Liaison Working Group and asked for nominations for members. He also wanted to get PPSP-type people for the Technical Advice Working Group, but he expected a very flexible membership. Srivastava asked how long the working groups would operate, and Moore replied that they would exist for three years, with more activity in the early stage than later. Ludden asked whether any of the working groups would look at shipboard facilities because he worried that the results of Moore's survey might not reflect true feelings about the issue. Moore replied that he had received a real mix of responses, and those who worried about a large shipboard lab had valid concerns. IPSC held a unanimous view, however, that you had to design the riser ship from the start with the broadest range of capabilities and decide later whether to take full advantage of those capabilities. Robertson added that the floating university concept had powerful appeal from the start.

I. Membership of new PPGs

1. Arctic Climate PPG

Hay recommended Kristoffersen as chair because he did not have a proposal in the system. Miller said that some SCICOM members had considered that issue but would rather choose a paleoceanographer as chair. He also said that the committee should remain flexible at this point and suggested having co-chairs. Tarduno noted that the two proposed chairs (Kristoffersen and Backman) had worked together extensively and you could not go wrong with either one.

SCICOM Motion 99-2-12
SCICOM endorses Yngve Kristoffersen and Jan Backman as candidates for chair or co-chairs of the new Arctic PPG. The chair(s), in consultation with the JOIDES Office, will select the other members of this PPG from among a list of nominees endorsed by SCICOM and from other sources. The membership should reflect the climate focus and other requirements of the PPG mandate (see SCICOM Motion 99-1-5) and include one member with previous experience on the Extreme Climate PPG. SCICOM must approve the final membership.

Miller proposed, Robertson seconded, 14 in favor, 1 absent (Coffin).

2. Hydrogeology PPG

The committee reviewed a list of candidates for membership on the PPG. Moran inquired about whom would serve as chair. Brown replied that several highly qualified candidates had declined to serve as chair but Bekins had suggested Shemin Ge. C. Moore expressed confidence in her scientific credentials but worried about her knowledge of and commitment to ODP. Hay spoke in support of Ge as chair.

SCICOM Motion 99-2-13
SCICOM appoints Shemin Ge as chair of the new Hydrogeology PPG. The chair, in consultation with the JOIDES Office, will select the other members of this PPG from among a list of nominees endorsed by SCICOM. SCICOM must approve the final membership.

Brown proposed, Moore seconded, 13 in favor, 1 abstained (Zachos), 1 absent (Coffin).

J. Deep Biosphere PPG

The committee engaged in a lengthy discussion about the possibility of disbanding the Deep Biosphere PPG and reconstituting it in a different form. Ludden thought that SCICOM overreacted at its last meeting and that we needed to keep the expertise of this PPG available for at least a year or two. Holm agreed that we needed to continue receiving input from the microbiologists. Miller thought that the job now looked as if it fell under the mandate of SciMP, and Moran asked about the possibility of integrating microbiology elsewhere within the advisory structure. Robertson and Humphris favored keeping a core group of microbiologists together because dispersing them among other groups would dilute their impact. Moran suggested that we could incorporate microbiology into the program in other ways, for example at the national committee level. She also asked about the difference between the old and the new mandate, and Hay answered that a new mandate did not exist yet, only a statement of intent. Moran then suggested that the committee should examine the mandate of the old group to see if the problem lay there. Robertson promised that such a discussion would eventually take place. Hodell wanted to make it clear that the new group would have a revised mandate so as not to result in more of the same. He also said that it seemed like we needed a new model for a planning group. Klein suggested softening the language about the revised membership in the proposed motion, and Miller suggested not mentioning the membership at all. Robertson added that the new PPG could remain small.

SCICOM Motion 99-2-14
Given the importance of the deep biosphere within the Long-Range Plan and the normal 3-year term length of a PPG, SCICOM at its Spring 2000 meeting may institute a new Deep Biosphere PPG (with a revised mandate). Toward this objective, SCICOM invites a representative of the current Deep Biosphere PPG to attend this meeting, present that group's achievements, and suggest future science initiatives in this field.

Robertson proposed, Holm seconded, 14 in favor, 1 absent (Coffin).

K. New PPGs?

1. Small Drill PPG

Miller offered that this could represent an example of an alternate platform, but Humphris believed that this did not constitute an appropriate topic for a PPG. Srivastava and others concurred and let the matter drop.

L. Discussion of Panel Chairmanships, Memberships, and Rotations

Humphris believed that a problem definitely existed with having too many U.S. chairs. Ludden agreed, noting that the problem would worsen when the JOIDES Office rotated back to the U.S. Humphris reminded the committee that they held the responsibility to name the panel chairs, and Robertson presented a draft motion regarding this matter.

SCICOM Motion 99-2-15
SCICOM reaffirms the policy that, when replacing or appointing new JOIDES panel chairs, the appropriate balance between U.S. and other members should be respected as much as possible.

Robertson proposed, Moore seconded, 13 in favor, 2 absent (Coffin, Zachos).

1. OPCOM

The committee deferred the discussion of OPCOM membership until the joint session resumed. Hay suggested that the non-US members should come from those not now on OPCOM. Humphris said that they discussed having one OPCOM member stay on for another year, and Miller said that they wanted C. Moore to stay on. Tamaki noted a need for paleoenvironment expertise, but Natland pointed out that OPCOM members should have operations expertise rather than some particular science expertise. Miller said that nonetheless it would not hurt to have that expertise, and Moore said that he would not object to having a paleoceanographer on OPCOM. SCICOM then nominated several candidates for OPCOM membership and proposed letting Hay decide.

2-3. SSEPs

Neil Lundberg had taken over as ESSEP Chair, and Julie Morris would take over as ISSEP Chair after the next meeting. At the request of the SSEPs chairs, the committee revisited the issue of liaisons to the PPGs because of an unintended consequence of the decision made at the previous SCICOM meeting (see SCICOM Motion 99-1-7). The following motion reinstates the right of the SSEPs to appoint liaisons to the PPGs and clarifies the option of inviting PPG chairs to attend SSEPs meetings.

SCICOM Motion 99-2-16

SCICOM requests EXCOM to amend the Terms of Reference for Program Planning Groups as follows:

6.5 **Liaison.** ~~SCICOM establishes liaison with the PPGs by the appointment of non-voting liaisons~~. The SSEPs will appoint liaisons to the PPGs, and ~~The~~ PPG Chairs ~~will~~ may attend one meeting of the SSEPs per year, ~~as~~ if requested by the SSEPs Chairs.

Srivastava proposed, Holm seconded, 11 in favor, 4 absent (Coffin, Hay, Hodell, Zachos).

4-7. TEDCOM, SCIMP, SSP, and PPSP

No actions taken at this time.

M. Other matters

While OPCOM met separately to devise a schedule, Humphris led a discussion about what to do with the proposals that fell below the cut-off line for possible scheduling in 2001.

355-Full7 Peru Margin

The consensus is that this proposal is not competitive against other convergent margin hydrate proposals. The proponents should submit a revised proposal for the new program after additional site surveying planned for 2000.

451-Full5 Tonga Forearc

This proposal has fallen below the cut-off line several times. SCICOM feels enthusiastic about the underlying idea, but remains concerned about the drilling strategy. The consensus is that this proposal should be dropped from further consideration, but that the proponents should be encouraged to submit a new proposal for the post-2003 program.

477-Full2 Okhotsk and Bering Seas

This is the first time this proposal has been seen by SCICOM. The proponents should address concerns about age control and the proxies to be used. It would also be more attractive to SCICOM if the proponents were to prioritize and reduce the number of sites.

478-Full4 Eastern Nankai

The proposal needs revision to clarify the objectives and incorporate better seismic data. A revised proposal would go out for review again.

489-Full2 Ross Sea

The proponents have informed SCICOM that a revision will be submitted for the 1 October 1999 deadline. The revised proposal will not go out for review again, but the SSEPs will look at it.

535-Full2 735 Deep

SCICOM is concerned that the nature of the boundary plays such an important role in determining what questions could be addressed and the extent to which answers might be found. Some members of SCICOM also expressed concern about the remoteness of the area from the ship track and about devoting two legs to a single project with only ten legs left to go in the program. SCICOM agreed

that the proposal should not go out for review again, but that the proponents should have an opportunity to respond to SCICOM concerns.

549-Full Arabian Sea OMZ

This proposal reads as though two proposals were combined, with an introduction. It would be better received it if appeared to be a more carefully integrated project. No further review is needed.

553-Full Cascadia Margin

SCICOM would like to see a microbiological component added to the proposed program. SCICOM would also like to see better site justifications and would like to have the proponents consider reducing it to one leg.

Wednesday, August 18 ..... 8:30

N. OPCOM Presentation of Alternative Schedules

Hay presented three alternative schedules as forwarded from OPCOM. Model 1 included the full program at Nankai, Model 2 included only LWD, and Model 3 included LWD and only one advanced CORK. Models 2 and 3 also included an extra leg at the beginning of the schedule for either Proposal 510 (Marion Plateau) or 534 (Shatsky Rise). In addition, all three models involved choosing between Proposal 499 (E. Pacific ION) and 500 (H_2O observatories).

Hay noted that the decision of whether to drill Proposal 499 or 500 had budgetary implications. Wiens asked about the priority of the ION sites within the program and why we could not schedule both of these highly ranked proposals. Humphris said that Proposal 500 would have a larger science impact than Proposal 499 because of the cable and the chance for a real-time observatory. Wiens noted that the group of unscheduled proposals would include either Proposal 499 or 500 and Proposal 505 (Mariana Convergent Margin), which all ranked higher than either Shatsky Rise or Marion Plateau. Hay explained that new information had arrived indicating that Proposal 505 lacked sufficient seismic data. Miller said that the idea was to get flexibility in scheduling this year, but we should make it clear that we intend to do the other ION site.

Wiens expressed concern about starting to strip away important science at Nankai, changing it from what was reviewed and ranked. Humphris believed that limiting Nankai to only LWD would severely compromise the science objectives. Robertson thought the committee should consider the previous commitment to Nankai and adopt Model 1, with the contingency to switch to Model 2 if the advanced CORKs were not ready. C. Moore characterized the CORKs as essential at Nankai, saying they would set us up for a new program. He emphasized that two CORKs would give hydrogeology, whereas one would only give earthquake monitoring. Tarduno agreed on the importance of the advanced CORKs.

Miller favored doing the full program at Nankai, but he also wanted to include Proposal 510. Humphris remarked that Proposal 510 had ranked low (#10) and inserting it at the beginning of the schedule would increase the weather risk on later legs. Hodell argued for pushing the weather window on Proposal 546 (Hydrate Ridge). C. Moore felt that the weather should remain satisfactory off Oregon in October, but late November would carry a high risk, while Brown expressed concern about October based on personal experience. Fox advised that although we had to leave the western Pacific behind, we could still access the NE Pacific later in the program. Bond argued for drilling one hole from Proposal 477 in the Bering Sea on the way around the North

Pacific, but Baldauf noted that this would push Proposal 546 completely off the schedule for weather reasons. Klein objected that Proposal 477 had not ranked above the line, but Bond still thought this stood out as an exception. Hay responded that he would prefer to do fewer things well rather than have the drilling activities spread too thinly. Also, he did not want to push the weather window even further for later legs.

Carter believed that Proposal 510 would interest a wide range of sedimentologists and stratigraphers who had not traditionally participated in ODP. Hodell felt that it had de-emphasized the paleoceanographic aspects but remained a multi-faceted project. Bond asked whether sea level appeared as a high priority in the LRP, while Miller noted the low cost of the leg. Klein said that the committee had already ranked the proposals and should now talk about scheduling. Hodell replied that this did constitute a scheduling issue because it represented the last opportunity to get a sea-level record from the western Pacific. Robertson suggested that perhaps we should consider Fox's advice. Humphris thought we should schedule Proposal 510 or 534 now if possible and do a better investigation of the weather window off Oregon for Proposal 546.

O. SCICOM Vote on Schedule

Hay called for a decision on scheduling the full or partial program at Nankai.

SCICOM Motion 99-2-17
SCICOM opts to include LWD and advanced CORKs as part of the scheduled science plan for the second leg at W. Nankai (Proposal 517-Full).

Wiens proposed, C. Moore seconded, 12 in favor, 1 abstained (Brown), 2 absent (Coffin, Zachos)

Hay then called for a decision on the option of including either Proposal 534-Full or 510-Full3 at the beginning of the schedule for 2000. Tamaki argued that both proposals had ranked quite low (#9 and 10, respectively). Moran noted that Proposal 534 had a greater potential for success with staffing, but Humphris and Hodell disagreed and said that the committee should not even consider this issue. Tamaki again emphasized the low rank of both proposals, while Hodell reiterated that we would not have any more chances in the western Pacific. Wiens asked how far the proposed schedule would extend into the following year, and Baldauf answered two months. Srivastava suggested skipping Proposal 546 altogether. Robertson said that he would like to include either Proposal 510 or 534 in the schedule and suggested proceeding with the vote.

SCICOM Motion 99-2-18
SCICOM will place either Proposal 534-Full or 510-Full3 (ranked 9 and 10, respectively) at the beginning of the drilling schedule for 2000 because the future ship track will most likely preclude the scheduling of these proposed legs during the remainder of the program.

Robertson proposed, Miller seconded, 10 in favor, 2 against (Tamaki, Bond), 1 abstained (Brown), 2 absent (Coffin, Zachos)

Before voting to approve the final drilling schedule for 2001, the committee conducted separate votes to decide between Proposals 510 and 534 and between Proposals 499 and 500.

SCICOM Motion 99-2-19
SCICOM places Proposal 510-Full3 at the beginning of the drilling schedule for 2000 (see SCICOM Motion 99-2-18).

Srivastava proposed, Robertson seconded, 8 in favor, 2 against (Tamaki, Bond), 3 abstained (Wiens, Moore, Brown), 2 absent (Coffin, Zachos)

SCICOM Motion 99-2-20
SCICOM decides to schedule Proposal 500-Full2 rather than 499-Rev.

Hodell proposed, Humphris seconded, 12 in favor, 1 abstained (Brown), 2 absent (Coffin, Zachos).

SCICOM Motion 99-2-21
SCICOM approves the drilling schedule for 2001 and beyond, as shown below. This schedule could change to take advantage of optimal weather windows, but all projects will be scheduled.

510-Full3	Marion Plateau
431-Rev	W Pacific Network - WP-1
517-Full	Nankai (LWD + CORKs)
523-Full	Hawaii-Emperor Seamounts
546-Full	Hydrate Ridge
500-Full2	H2O Observatory
486-Rev2	Paleogene Equatorial Pacific
465----	SE Pacific Paleoceanography

Humphris proposed, Holm seconded, 10 in favor, 1 opposed (Wiens), 2 abstained (Brown, Tamaki), 2 absent (Coffin, Zachos).

SCICOM then discussed a possible motion concerning the fate of Proposal 499. Moran recommended considering how to develop community involvement and the science party for ION legs. She added that the OPCOM discussion made it clear that we could reach the location easily from anywhere in the Pacific Ocean. Hodell asked whether we really needed ION sites in the Southern Hemisphere and whether Proposal 499 would give us anything more than Proposal 500. Wiens replied that it would test data acquisition without a cable and added that we did not have any more ION proposals in the system. Furthermore, this one represented the highest rated unscheduled proposal and it would have to happen in 2002 or not at all. Humphris said that this decision differed from the splitting done with the earlier ION sites WP1 and WP2, and the fact that Proposal 499 ranked highly did not differentiate it from all other highly ranked but unscheduled proposals. Robertson agreed with Humphris and thought that it would remain highly ranked. Natland suggested not restricting it explicitly to 2002 when it could be done in 2003. Srivastava agreed because SCICOM had already scheduled one leg for 2002. Tamaki said that SCICOM should not make too many commitments for 2002. Wiens could not understand the reluctance to commit to this proposal after the earlier discussion. Klein feared that a specific motion would lock us in.

SCICOM Motion 99-2-XX (did not pass)
SCICOM recognizes the importance of completing the high-priority ION sites and thus intends to schedule Proposal 499-Rev during 2000.

Wiens proposed, Holm seconded, 4 in favor, 7 opposed, 2 abstained (Brown, Robertson,), 2 absent (Coffin, Zachos).

After the proposed motion failed to receive a majority of votes, Miller suggested voting again after striking the reference to 2002 and just saying before the end of program. Hodell suggested adding that it would go forward for scheduling without re-ranking and Klein agreed.

SCICOM Motion 99-2-22
SCICOM recognizes the importance of completing the high-priority ION sites and thus intends to schedule Proposal 499-Rev before the end of the current program. SCICOM will forward this proposal to OPCOM for possible scheduling at the August 2000 meeting.

Wiens proposed, Holm seconded, 9 in favor, 2 opposed (Hodell, Tamaki), 3 abstained (Brown, Robertson, Zachos), 1 absent (Coffin).

The committee then discussed the possibility of future operations in the Atlantic Ocean. Tamaki believed that the ship would certainly move to the Atlantic anyway and questioned the need for a specific motion, but Holm stressed the importance of sending a clear signal to encourage submission of proposals for the Atlantic. Humphris worried that it would sound as if we wanted to exclude all but the Atlantic. Srivastava suggested that the submission of proposals for the Atlantic had slowed because the ship had operated in the Pacific for the last three years.

SCICOM Motion 99-2-23
SCICOM resolves that the *JOIDES Resolution* will operate in the Atlantic Ocean during at least part of 2002.

Moore proposed, Holm seconded, 9 in favor, 1 opposed (Tamaki), 3 abstain (Brown, Robertson, Zachos), 2 absent (Bond, Coffin).

P. SCICOM Subcommittee report on draft motions for Panel Chairs, Committee, Panel, and PPG memberships. Vote on draft motions

See Sections I–J above.

Q. Report on OD-21

Takagawa showed the proposed schedule of the ship design and construction. He also reviewed certain recommendations from SciMP and showed how the design would accommodate these suggestions. The latest design showed that the OD-21 ship would have up to four times more lab space than the JR, with about ±1°C temperature variability. T. Moore noted that a better temperature control would require a noisier system. Takagawa described the options for berthing space, ideally with single or no more than double rooms, each with a private shower and toilet. He also reported that re-supply would nominally occur every two to four weeks. T. Moore asked about the limiting factor for re-supply, and Takagawa answered fuel. Klein wondered if the savings associated with increased fuel storage capacity would offset the expense of the re-supply ships. Humphris inquired whether the re-supply boats could offload core and reduce the need for core

storage space. Natland asked if the need for re-supply would create difficulty in going to certain parts of the ocean. C. Moore asked about the difficulties of re-supply in rough seas.

Moran commended JAMSTEC for accommodating the SciMP recommendations so quickly and asked whether the lab and core storage containers would have a flexible design for use on other platforms. Moran also asked about the possibility of designing the riser ship to operate in water shallower than 500 m, particularly if warranted by proposal pressure. She noted that we had not drilled very deeply on continental margins for safety reasons. Takagawa answered that dynamic positioning works only to within 5 m, and in shallow water this corresponds to a large angle of motion and increased stress on the riser. Moran asked about the possibility of anchoring the ship, and Takagawa replied that changes in the wind, swell, or current direction would cause problems, but he drew a diagram of potential mooring systems showing one that could allow some rotation of the ship.

R. Conceptual Design Committee (CDC) Report

Peggy Delaney reported on the progress of the new Conceptual Design Committee (CDC) for the non-riser ship. Srivastava asked whether the new ship would have shallow-water capability. Delaney anticipated receiving target sections for shallow-water sites. The CDC would try to achieve the widest range of objectives in the most efficient manner and identify things that we could not do without other platforms. Hay asked how input from the international community could reach the committee. Delaney replied that this would probably happen through IPSC, though communication should remain wide open. The CDC would take input from anyone and wanted to maintain the strength of full international participation.

S. COMPLEX Report status

Moran reported that JOI had posted the latest draft version of the COMPLEX report on their website and she expected to see the final report in January.

T. New Business

Hay reviewed the list of possible co-chiefs for the newly scheduled legs and asked the committee for additional suggestions.

U. Future Meetings

Hay mentioned that the next SCICOM meeting, tentatively scheduled for 16-19 February 2000 in Washington, D.C., would occur in conjunction with EXCOM. Miller asked whether SCICOM would have a joint session with EXCOM or whether they would simply observe our meeting? Hay said that he envisioned a common session of symposia.

The discussion then turned to the August 2000 SCICOM meeting. Ludden noted that IGC would meet in Brazil in mid August. Moran explained that holding the meeting later in August would impact the program plan, and Humphris added that it would also leave little time before the next proposal deadline. Srivastava offered to host the summer meeting in Halifax in early August. Hay suggested 2-5 August 2000 and the committee accepted this plan.

V. Review of Motions and Action Items

SCICOM Consensus 99-2-24
From the land of the rising sun a new drilling program dawns. The sun sets on Kensaku Tamaki at SCICOM, but rises again over a new InterRidge leader. SCICOM thanks Kensaku for his numerous, significant, and incisive contributions to our deliberations. We know he will remain an important player in marine geosciences, both nationally and internationally, and we look forward to working with him in other future capacities.

SCICOM Consensus 99-2-25
SCICOM thanks Kevin Brown for his long and continuous service that spanned the challenging transition from PCOM to SCICOM. We appreciate Kevin's keen scientific insights, always offered in a genial style, and his imperturbable nature during tense moments. We wish him well in his scientific endeavors as he retreats from the meeting room to the pleasures of sea-floor seeps and soft mud.

SCICOM Limerick 99-2-26
Ode to Jim Natland (by E. Klein)
The indefatigable Jim,
Heads bow and hats tip off to him.
On matters related
To drilling and data
It's clear we can't function without him.

SCICOM Consensus 99-2-27
SCICOM bids fond farewell to charter OPCOM member Dave Hodell who unhesitatingly jumped into the breech of SCICOM. Dave's perspective, ranging from the ice of the subantarctic to the fire of Florida and Guatemalan lakes will be sorely missed.

SCICOM Consensus 99-2-28
SCICOM bids fond farewell to two long-time PacRim members, Shiri Srivastava and Bob Carter. Shiri has ardently supported ODP since Leg 105, serving as chair of the Site Survey Panel and most recently on SCICOM. Bob has observed the rises and falls of the sea-level issue within ODP, served as a charter OPCOM member, and provided a unique perspective to ODP issues from down under. We will miss them and wish them well as they travel to the antipodes of the PacRim.

SCICOM Consensus 99-2-29
SCICOM expresses gratitude to Susan Humphris, our first chair and guiding light in the intricacies of the new advisory structure. Without her dedication, innovative talents, and discipline, the advisory structure would not have developed into the well-oiled, proposal-nurturing machine we know today. We wish her well in the months until we find a way to make use of her energy and talents in a new capacity! May her service on the USSAC Conceptual Design Committee represent the start of a long and distinguished post-SCICOM career.

SCICOM Consensus 99-2-30
SCICOM congratulates Ted Moore on a job well done as the first chair of the ESSEP, and we wish him well as the first chair of IPSC. His talents as researcher, professor, petroleum geologist, director, guru, soothsayer, and knight in shining armor will all serve him well in this endeavor. May we all live by the motto "In Ted we trust."

SCICOM Consensus 99-2-31
SCICOM takes this opportunity to thank John Tarduno for his service as the chair of ISSEP, though he still has one more meeting. John accepted the position of chair when ISSEP was first created. He has worked extremely hard to ensure that each proposal receives the most thoughtful and fair consideration possible and has taken the nurturing role of the SSEPs very seriously. One of the great successes of the new JOIDES advisory structure has been the synergy between the two SSEPs. This can be attributed to the strong leadership provided by both John and Ted, and will be a legacy to their service. SCICOM acknowledges John's dedication to ODP and the excellent job that he has done as chair of ISSEP. We wish him well in the future and look forward to his continued involvement in ODP.

SCICOM Consensus 99-2-32
SCICOM thanks Casey Moore for a relaxing meeting under the mists and redwood trees of the Santa Cruz Mountains. Being lost in the trees adds a new ambience to the unique beauty of the Santa Cruz campus and our memories of the meeting. We also thank Casey and John Tarduno for leading the field trip, and we thank UCSC and JOI for hosting the social events. As we return to our own institutions, the cover of our Agenda Book will remind us of the hospitality extended by the "banana slug" university.

Meeting adjourned *17:00*

ANNEXE 1

• Leg 185 Objectives •

Previous drilling already laid the foundation for much of the crustal flux equation at the Izu and Marianas subduction systems, and provided a strong rationale for continuing the effort to detemine the mass balance fluxes across the subduction zones. The missing part of the flux equation is largely the input: (1) both the incoming sediment and basaltic sections approaching the Izu-Bonin Trench – Site 1149, and, (2) the altered oceanic crust seaward of the Mariana Trench - Site 801. In addition, both sites are located along the same flow line in Mesozoic Pacific oceanic crust, from about 170 to 130 Ma, and provide an unparalleled opportunity to study the geochemical and physical nature of old Pacific crust, its tectonic, sedimentation and magnetic history.

The primary motivation for returning to ODP Hole 801C was to sample the upper oxidative zone of alteration of this oldest in situ oceanic crust. Previous drilling during Leg 129 only penetrated 63 m into "normal" Jurassic basement. Based on other basement sites, the upper oxidative zone of alteration, which contains the lion's share of some element budgets (e.g., K, B, CO2), lies in the upper 200-300 m of the basaltic crust. Specific objectives were:

• to characterize the geochemical fluxes and geophysical aging attending the upper oxidative alteration of the oceanic crust at Hole 801C

• to comparing igneous compositions, structure, and alteration with other drilled sections of in situ oceanic crust (in particular Hole 504B)

• to help constrain general models for seafloor alteration that depend on spreading rate and age (Hole 801C is the world's oldest oceanic crust at 165 Ma and formed at an ultafast-spreading ridge at 160 km/Ma, so it embodies several end-member variables).

• to test models for the Jurassic Magnetic "Quiet" Zone.

Site 1149

Previous drilling in the Nadeshda Basin failed to penetrate resistant cherts, and most of the sediment column was unsampled. Only 1 m of basalt was recovered previously from this vast area. Specific objectives were:

• to provide samples of the sediment and altered basalt subducting at the Izu trench

• to contrast crustal fluxes to the Izu-Bonin trench with those for the Marianas, to test whether along-strike differences in the volcanics can be explained by along-strike variations in the subducted inputs.

• to compare basement alteration with that at Hole 801C (along a crustal flow-line)

• to provide constraints on the Early Cretaceous paleomagnetic time scale (to M11)

• to provide constraints on mid-Cretaceous carbonate compensation depth (CCD) and equatorial circulation fluctuations.

Microbiology Objectives

The deep (~ 6000 m) and old oceanic crust provided an intriguing target for the search for hidden bacterial life. Leg 185 was the first ODP leg to incorporate microbiology as a major new initiative. Specific objectives were:

• to quantify the biological contamination created by APC, XCB and RCB coring.

• to develop a sample handling strategy for routine microbiological sampling.

• to conduct culturing experiments with several media at both atmospheric and in situ pressure.

ANNEXE 2

• Leg 185 Results •

• A Legacy Site into Jurassic Crust.
Hole 801C was deepened by 340 m into basement, providing a total basement section of 470 m, making it the sixth deepest drill site into normal oceanic crust. Recovery was very good (47%), and a high quality set of logs were run to 388 m in basement. The hole is in good condition, and it remains a legacy site into the world's oldest oceanic crust.

• A Complete Sedimentary Sequence in the Nadeshda Basin, W. Pacific
Site 1149 is the first complete section through the pelagic sediments (~ 400 m) of the Nadeshda Basin, a ~1000 x 1000 km region in the western Pacific. Over 90% of the sedimentary section was either recovered or logged, and sedimentary units at 1149 can be traced seismically across the Basin. Thus Site 1149 is an important reference site for Mesozoic equatorial sedimentation since the Upper Valanginian, and for sediment that is being subducted along the entire Izu trench.

• Mass Balance and Crustal Recycling at the Marianas Arc
After drilling Site 801C, the remaining piece of the crustal input inventory is complete for the Marianas subduction factory. Shorebased geochemical analyses of the basement section at 801C will provide the first robust geochemical fluxes for any subducting oceanic crust.

• Comparisons of the Input and the Output at the Mariana and Izu Arcs
In contrast to the sediments subducting at the Marianas trench, sediments at the Izu-Bonin trench lack a mid-Cretaceous volcaniclastic section, and contain more siliceous and carbonate-rich biogenic material due to its longer passage beneath zones of high biological productivity. Shorebased geochemical studies will demonstrate the extent to which these different sedimentary histories can be traced to the volcanic output from the two arc systems.

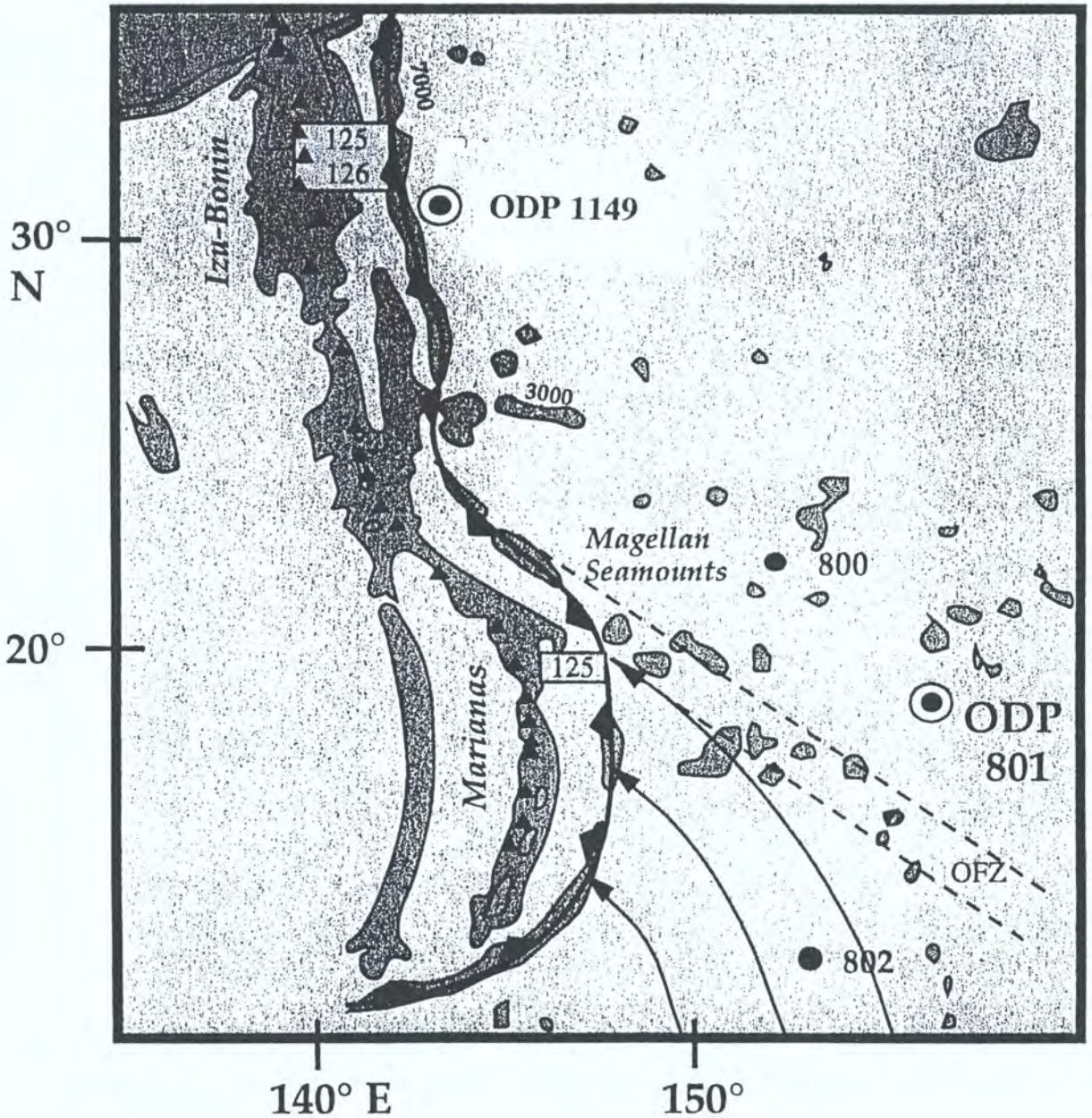
• The Aging of Fast Spreading Crust
801C and 1149 provide the first sections into Mesozoic fast spreading crust, layer 2A. Geochemical alteration of the volcanic section at 801C occurs in several discrete zones, associated with ocherous Si- Fe-hydrothermal deposits and thick massive flows. These zones control the alteration pattern of crust and contrast with «accepted» models for a gradual decrease down-hole in the alteration of oceanic basement. The pattern of alteration at Site 801, controlled by local pathways for hydrothermal fluids, may be a feature of fast spreading crust.

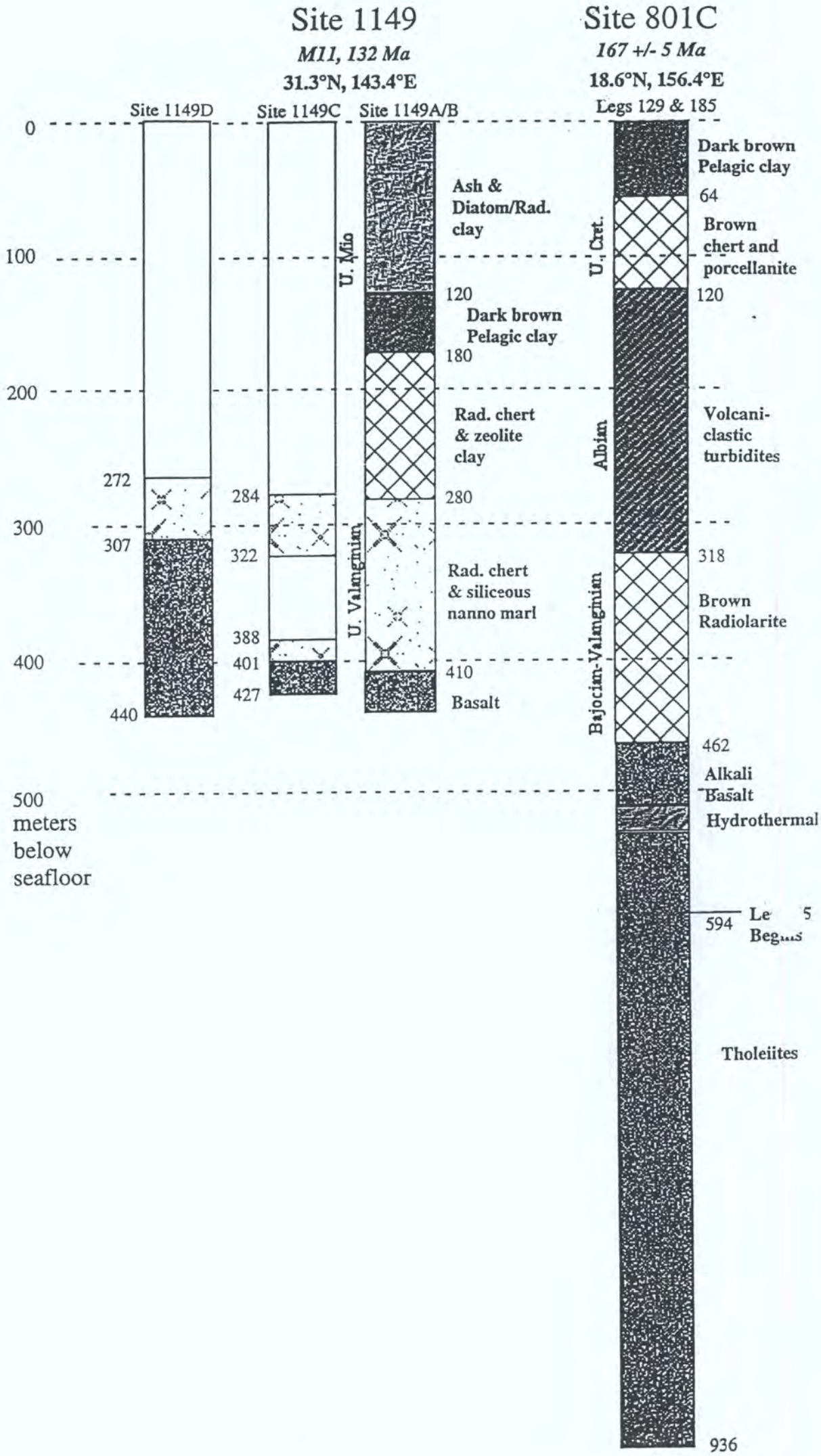
• The Jurassic Magnetic Quiet Zone
Hole 801C Jurassic basement appears to record up to six geomagnetic reversals, and some sections preserve transitions in the magnetic field from one polarity interval to the other. Thus igneous basement at 801C was extruded at a time of rapid polarity alternations, which may ultimately explain the origin of the Jurassic Quiet Zone.

• The Deep Biosphere
Leg 185 was the first to invest in a major microbiological effort. Contaminant tests using perfluorocarbon and fluorescent microspheres showed that several APC core interiors were entirely free of contaminants, and RCB core interiors were free of microspheres. These tests demonstrate that biological contamination can be assessed and surmounted. Glass samples from Site 801C showed textural evidence for biocorrosion and may indicate on-going microbial activity in 165 Ma basalt.

• The Petrology of Mesozoic Crust
Over 50 samples of fresh basaltic glass were recovered from Sites 1149 and 801, providing pristine samples of the igneous liquid that forms Mesozoic Pacific crust. These valuable samples record mid-ocean ridge processes, mantle composition and mantle temperature at a time preceding the Cretaceous superplume event in the Pacific.

Marianas and Izu-Bonin Arcs
including ODP Leg 125, 126 and 129 sites
and Leg 185 Sites (801C and BON-8A)




Site 1149
M11, 132 Ma
31.3°N, 143.4°E
Site 801C
167 +/- 5 Ma
18.6°N, 156.4°E
Legs 129 & 185
Site 1149D
Site 1149C
Site 1149A/B
0
100
200
300
400
500
meters
below
seafloor
272
307
440
284
322
388
401
427
U. Mio
U. Valanginian
Ash &
Diatom/Rad.
clay
120
Dark brown
Pelagic clay
180
Rad. chert
& zeolite
clay
280
Rad. chert
& siliceous
nanno marl
410
Basalt
U. Cret.
Albian
Bajocian-Valanginian
Dark brown
Pelagic clay
64
Brown
chert and
porcellanite
120
Volcani-
clastic
turbidites
318
Brown
Radiolarite
462
Alkali
Basalt
Hydrothermal
594
Tholeiites
936

EOS v.80 Nov. 30, 1999 p. 580

New Shipboard Laboratory May Answer Questions about Deep Biosphere

A shipboard microbiology laboratory to investigate the extent and diversity of the subsurface biosphere in the ocean basins is being developed by the Ocean Drilling Program (ODP) and may soon provide answers to some of the exciting questions about Earth's deep biosphere. The answers may also be relevant to explorations for extraterrestrial life.

The oceanic subsurface biosphere may contain half of Earth's biomass [*Whitman et al.*, 1998]. Each liter of deep sea sediment, even at depths of a kilometer below the seafloor, typically contains more than 1 billion microbes. Volcanic rocks below the sediment also appear to contain microbes at all depths investigated so far, except where the temperature exceeds 100°C. Although microbes probably contribute less than a gram of biomass per cubic meter of oceanic crust, the vast amount of oceanic sediment and rock makes the total microbial biomass globally significant.

A temporary laboratory was built on the drilling ship *JOIDES Resolution* during ODP Leg 185, and identification of organisms from the deep ocean crust may be a result of work in it. The facility has been used to examine the deep ocean crust, sediments, and water for evidence for endolithic microbes and to test these samples for contamination from drilling. They also wanted to determine the extent of microbial colonization of the ancient ocean crust.

The permanent laboratory, which will be available to seagoing microbiologists, is now under construction. Its addition to the ship and refinements in chemical and particle tracer techniques may lead to answers to, among other questions, what drives microbial metabolism, what is the biomass of deep microbial populations, what is their doubling time, and what effect do the microbes have on the composition of the crust and circulating fluids.

The answers may assist in studies of extraterrestrial life because the deep Earth environments being sampled by ODP appear to be similar to the interior of Mars. Chemoautotrophic microbes similar to those from the ocean crust could also live beneath the surface of Mars. If such microbes are confirmed on Mars, then the answer to the bigger question—were they introduced or did they evolve separately?—may be one of the most exciting discoveries in the next century.

Running from April 18 to June 15, 1999 Leg 185 drilled two sites, 801 and 1149, the first 1500 km southeast of Tokyo and the second 450 km, southeast of Tokyo, in ancient ocean crust. The primary objective was to sample crust in the Pacific Ocean to understand the mass balance and recycling of crust at subduction zones. In-situ igneous rocks about 170 million years old, the oldest so far obtained from the ocean crust, were recovered from Site 801, and they are some of the deepest igneous rocks ever obtained from the oceans, found more than 6500 m below sea level. These rocks can also be used to determine if microbes persist in old, deep ocean crust.

The temperature in the drill hole was 20-30°C and ambient hydrostatic pressure was 630 to 670 bars. Microscopic examination of rocks from depths of 500 to 900 m below the seafloor revealed that volcanic glass was being altered by invasive channels and tubes (Figure 1). This is similar to the alteration of younger deep-sea basalt glass that has been attributed to microbes [*Thorseth et al.*, 1995; *Fisk et al.*, 1998; *Furnes and Staudigel*, 1999].

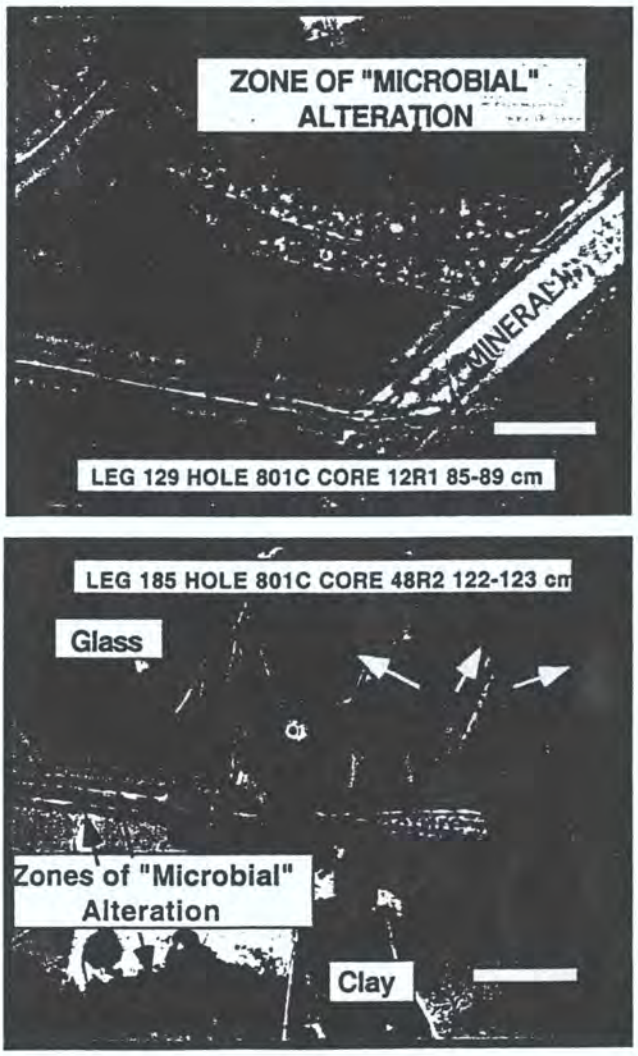


Fig. 1. Photomicrographs of basalts from 585 and 929 m below the seafloor at Ocean Drilling Program Hole 801C. Thin irregular alteration around a fracture is found in the shallow basement rocks (top) as well as in the deepest rocks recovered from the hole. Photos taken aboard the JOIDES Resolution by Martin Fisk.

With the temporary microbiology lab on the ship, anaerobic cultures could be started from glassy basalts and other rocks using a variety of metabolic substrates. If these cultures are successful, we may be able to identify the organisms that inhabit the deep, ancient parts of the ocean crust. Efforts are also underway to maintain and culture organisms at ambient subseafloor pressures because some barophilic organisms cannot survive at atmospheric pressure.

Even if we are successful at culturing microbes, the question remains as to whether the organisms in cultures are representative of life in the ocean crust or whether they were introduced by the drilling process. In order to answer this, we conducted two experiments on Leg 185 to measure drilling contamination of rocks and sediment.

A chemical tracer was introduced into the drilling water at a concentration of 1 ppm. The tracer-laden water was pumped at 1100 to 1800 L/min through the drill bit, so samples were in continuous contact with the tracer.

A picogram of the chemical tracer could be measured with an electron-capture detector on a gas chromatograph on the ship, and because of the high sensitivity of this technique, 0.01 microliters of drilling fluid per gram of sample could be detected. Analysis of the interiors of rocks and sediments for the tracer determined that about 0.03 microliters of fluid had penetrated into the hard rock samples but sediments were mostly free of contamination from drilling water.

Because the liquid tracer can penetrate into fractures and pores that are too small for microbes to enter, this technique is likely to overestimate the amount of microbial contamination in the cored samples. Even so, this method estimates that only a few tens of microbes per gram of sample were introduced.

Typically 100 mg of sample were used to inoculate cultures, so drilling did not appear to add significant quantities of contamination to the cultures. Also, contaminating microorganisms from seawater are not likely to be favored in cultures designed for anaerobic microbes that use mineral substrates as energy sources and carbon dioxide as the source of carbon (chemoautotrophs).

A physical tracer test also was used. Fluorescing, plastic microspheres the size of small microbes (0.5 micrometers in diameter), were dispersed at the bottom of the drill string during coring. These microspheres were found on the exteriors of rocks and sediments but they did not appear to penetrate fractures in the rocks and did not penetrate more than a few millimeters into sediment. This agrees with the chemical tracer experiment and indicates that cleaning or mechanically removing the exteriors of samples makes them suitable for cultures and DNA extractions. This result and the new laboratory are likely to lead to a new understanding of the oceanic subsurface biosphere

Acknowledgments

The members of the ODP Leg 185 Shipboard Scientific Party are Lewis Abrams, Jeffrey Alt, Robin Armstrong, Samantha Barr, Annachiara Bartolini, Graeme Cairns, Carlota Escutia, Martin Fisk, Giles Guerin, Shelley Haveman, Tetsuro Hirono, Jose Honorees, Katherine Kelley, Roger Larson, Francesca Lozar, John Ludden, Richard Murray, Terry Plank, Thomas Pletsch, Robert Pockalny, Olivier Rouxel, Angelika Schmidt, David Smith, Arthur Spivack, Hubert Staudigel, Maureen Steiner, and Robert Valentine.

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22 June 1999 FOR IMMEDIATE RELEASE

AN EXPEDITION TO A SUBDUCTION FACTORY
ODP Searches for Bacteria in Ancient Rock

An Ocean Drilling Program (ODP) expedition dedicated to the ocean's deepest trenches, the Mariana and Izu-Bonin, ended June 15 in the port of Yokohama, Japan. These trenches form the boundary between colliding tectonic plates, and cataclysmic events such as earthquakes, tsunamis, and explosive volcanism. At the Mariana and Izu-Bonin trenches, these collisions cause one plate to slide under the other plate, a process known as subduction. As one plate is subducted deep into the Earth, the material (sediments) on the plate and the plate itself are consumed and then re-generated to form materials that are expelled onto the Earth's surface in volcanoes. This process is part of an important Earth chemical cycle that scientists have dubbed, "the subduction factory."

The subduction factory is a dynamic system in which the subducting seafloor and overlying mantle are recycled and processed into new products on the upper plate. Beneficial products such as ore deposits are part of the factory's outputs. In order to understand the formation processes of previous ores and the timing and magnitudes of cataclysmic events, scientists need to know the true workings of the subduction factory. As in all factories, a knowledge of the most basic information is needed: what goes in versus what goes out. Or in scientific language, researchers need to understand the mass balance of chemicals cycled through Earth.

The scientific goal of this expedition was to determine important missing gaps in the factory cycling system along the Mariana and Izu-Bonin arcs. These gaps include an incomplete understanding of the aging process of the uppermost layer of the solid Earth, the flow of materials through the zone between deep sea trenches and volcanic arc, and the fluid circulation at active margins. The Mariana and Izu-Bonin arcs are ideal for subduction recycling studies because both are created by the same subducting plate, yet have distinct geochemical signatures. Studies of the relative amounts of several important components in the subducted plate (e.g., water, carbon dioxide, and trace metals) were used to determine whether the chemical differences between the two arc systems are the result of different inputs to the two trenches or different behavior of the subduction factories.

Another objective of this expedition was to sample the Earth's deep biosphere, and, in particular, to establish protocols for studying these potentially new life forms. It is currently speculated that a large part of the Earth's biosphere is locked beneath the ocean's floor. The discovery of bacteria, living in extreme conditions of pressure and temperature (extremophiles), has important implications for understanding the origins of life, discovering new life forms, understanding the

link between these Earth-thriving bacteria and the formation of oil and gas, and Earth's carbon budget.

Two deep-water sites were drilled and studied during Leg 185. The research team sampled and measured the *in situ* conditions of the upper alteration zone at an existing ODP Hole (801C), located seaward of the Mariana Trench, and the entire sedimentary section into basement at a new site (BON-8A) located near the Bonin Islands. These sites were drilled to depths as great as 900 m below the seafloor in up to 6 km of water. Samples were retrieved from these sites that represent the oldest rocks ever collected from the ocean floor and some of the deepest rocks ever recovered from the ocean crust. The chemical composition of the recovered rocks were measured as were properties of the borehole using special logging techniques.

Scientists discovered that patterns in the basalts collected at depths of 590 to 920 m below the seafloor were characteristic of those associated with life forms discovered previously in other younger and shallower parts of the ocean floor. This suggests that life can exist and survive in very high pressure settings and in rocks that formed 167 million years ago. Following the expedition, scientists will continue to study the microbes by culturing and extracting DNA from microbes in rock, sediment and water samples.

Samples collected by the scientists could potentially be contaminated by the actual drilling process. One of the scientists' objectives was to evaluate the amount of contamination in the recovered rocks and sediment. This was accomplished by injecting tracers into the seafloor as they drilled.

Challenges of the Deep

During Leg 185, ODP drilled in one of the deepest parts of the world's ocean. The sites were located in water depths ranging from 5.7 to 6 km. These water depths combined with the drilling depths pushed the state-of-the-art deep water drillship, *JOIDES Resolution*, beyond any previous drilling. The ship's derrick, designed to carry the weight of 9,000 m of steel drill pipe, successfully worked at its maximum capacity breaking a world record in deep water drilling.

The research vessel, *JOIDES Resolution*, departed for its next expedition to the Japan Trench on June 19. The goal of Leg 186 is to install long-term, deep, seabed observatories for the study of earthquakes and measuring properties of the Earth's mantle.

ODP

The Ocean Drilling Program, an international partnership of scientific institutions and governments, explores the Earth's history and evolution. The Ocean Drilling Program is funded principally by the U.S. National Science Foundation, with substantial contributions from its international partners. These include the Federal Republic of Germany, Japan, the United Kingdom, the Australia/Canada/Chinese Taipei/Korean Consortium for Ocean Drilling, the European Science Foundation Consortium for Ocean Drilling (Belgium, Denmark, Finland, Iceland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland), France and the People's Republic of China. The program is managed by Joint Oceanographic Institutions, a

consortium of 11 U.S. institutions, Texas A&M University is responsible for science operations, and Lamont-Doherty Earth Observatory of Columbia University is responsible for logging services.

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In addition, the ODP Web Site includes information on this leg (Leg 185 Scientific Prospectus)
http://www.oceandrilling.org

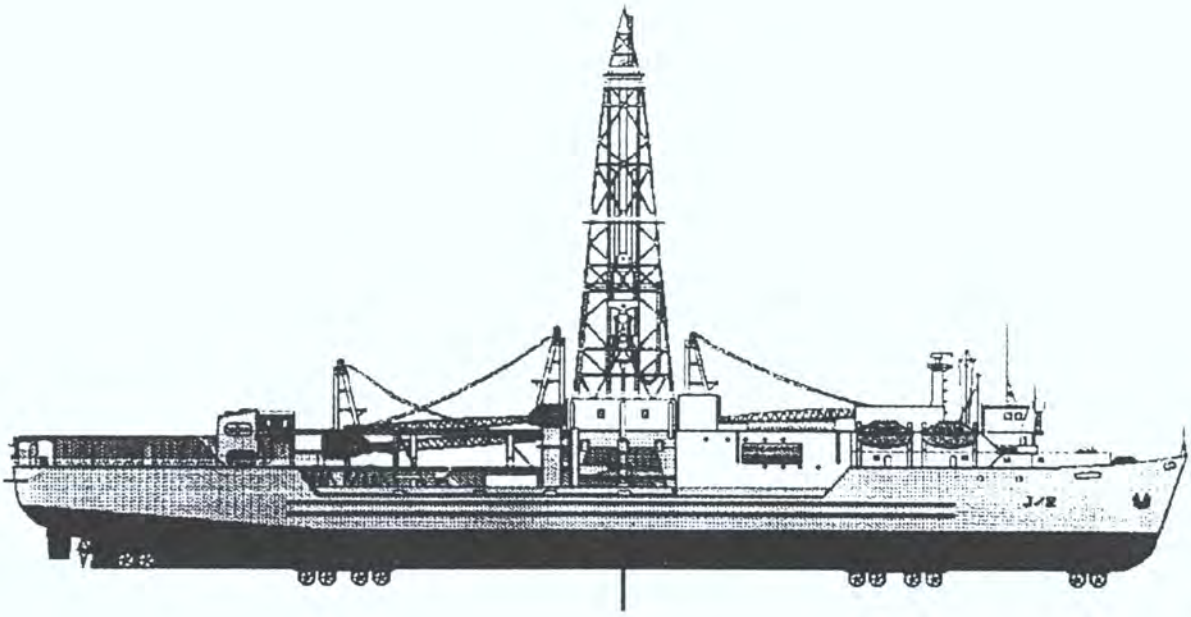
# # # #

Minutes and Background Annexes

25th TEDCOM Meeting

Held at College Station, Texas

December 1-2, 1999



ODP Drilling Vessel "Joides Resolution"

Currently on Leg 187 having completed

Drydocking and Upgrading October-November 1999

25th TEDCOM Meeting held at the Ocean Drillling Programme, Texas A&M University, College Station, on 1st and 2nd December 1999

TEDCOM Recommendations to SCICOM

Recommendation #1

TEDCOM re-affirm their earlier recommendation that MATLAB simulation studies be carried out as a matter of urgency on the data obtained from drillstring deployments using the passive and active heave compensation systems, downhole measurements of string dynamics and rig floor instrumentation.

During the 25th TEDCOM the committee were told that simulation studies had to be dropped in order to meet other requirements for work leading up to and during the dry dock and that upgrades may now mean that these were not so important. It is essential that a full understanding of the drill string dynamics be available as soon as possible in order that the upgrades made at dry docking can be fully utilised. Modelling will allow this. Currently there is no way of assessing and applying the results of any data gathering.

Recommendation #2

TEDCOM request that, if necessary, a commissioning engineeer for the active heave compensation system sail with the vessel on a science leg in order that this development is fully working and available in the shortest possible time.

TEDCOM were surprised to learn that a commissioning engineer had not sailed on the first science leg after the active heave compensation was fitted. This would have been considered as part of the contract & commissioning in a commercial environment. As problems are being experienced with the active heave operation on the present leg immediate steps should be taken to ensure that this does not continue. The 'fine tuning' of such a system is always required and it should not require encroachment of 'science time' on a leg to ensure that it works properly and for the benefit of the remainder of the programme in as timely a fashion as possible.

Recommendation #3

TEDCOM strongly recommend continuation of funding for development engineering until the completion of the present ODP programme.

During the meeting it was suggested that it would be difficult to justify funding for tool development in the latter stages of the present programme. Given that the science requirement will expect the best possible tools to be used, up to and until the final borehole on the last leg of the programme is completed, development and upgrading of tools will have to continue. It would also be unrealistic to expect any continuity of approach to tool development for a new programme if there was an hiatus of a number of years in those tool developments.

Final Draft Minutes of Meeting

Those attending:

Members	**Liaisons**	**Guests**
Hugh Elkins (USA)	Ted Burgoyne (IPSC)	Jeff Fox (ODP TAMU)
Marvin Gearhart (USA)	Bill Hay (SCICOM/OPCOM)	Brent Shoemaker (Sedco-Forex)
Howard Shatto (USA)	Brian Jonasson (ODP TAMU)	
Alister Skinner (Chair) (UK)	Kate Moran (JOI Inc.)	
Walter Svendsen (USA)		
Shinichi Takagawa (Japan)		
Sverrir Thorhallsson (ESF Alt.)		

Skinner welcomed everyone and after the opening remarks requested a self introduction of all present.

An agenda prepared for the meeting was circulated. The final agenda followed is attached and the following numbers/headings match the agenda items.

1. Opening Remarks

Jeff Fox opened the meeting by welcoming everyone into the new meeting room provided by the university who improved the meeting facilities of ODP TAMU while utilizing previously used space to make archive capacity for the further 50km of core anticipated during the remainder of the ODP programme. He then went on to acknowledge and highlight the massive effort put in by his staff and the contractor to the dry docking and upgrading of the Joides Resolution to make it properly fit for its science objectives until October 2003.

The Joides Resolution is now fundamentally different and has sailed again although it will be into January before the full shake-down is completed. The various changes include:

- New automatic station keeping
- New energy management system
- New floor on top of existing lab stack
- New rig instrumentation system for real time drilling and later analysis
- Active Heave Compensation

The cost of this, together with other refurbishments and enhancements cost approximately 10m USD of which 6m came from the US Science fund, 3m from co-mingled funds and 1m from ODL.

Kate Moran also referred to the fact that the vessel now has the capability to do things better and should also be able to work in shallow water. She also re-iterated that TEDCOM are responsible for providing the technical development guidance which is being followed and that progress is being made. Annex 1 contains overhead summaries.

There is a budget of 46.1m USD available to run the whole ODP programme and within that technical developments are required and funded.

An overhead illustration for the FY2000 Programme Plan stated that the budget was met while innovation was maintained and a number of successes were achieved, particularly relating to the Deep Biosphere. Further provision was made at the dry-docking for Deep Biosphere studies and the use of radio-isotopes for tracers is being reviewed. The use of large diameter logging strings is being investigated and involves running these strings to seabed outside the drill pipe.

A number of Technology Targets are still outstanding and the aim is for them to be completed by the end of the programme.

The programme budget of 46.1m USD per FY allows just over 1m USD to be spent on technology developments. In response to questioning it was stated that approximately 1m USD was spent on publications and approximately 150k USD on marketing. The publications budget should decrease when it is in a fully electronic media format.

2. Apologies for Absence

Apologies were received from members D. Eickelberg (Germany), S. Persoglia (ESF) and F. Schuh (USA), liaisons D. Goldberg (LDEO) and B. Malfait (NSF).

3. Approval of Minutes

The minutes of the 24th TEDCOM meeting held during the COMPLEX meeting in Vancouver, Canada were accepted with minor amendments to correct spelling errors. Skinner will check that all members received the full package of back-up material to the minutes.

4& 5. JR Dry docking Activities

Brian Jonasson detailed the projects undertaken by ODP TAMU during the dry docking, upgrading and refurbishing/recertification of Joides Resolution. Brent Shoemaker similarly outlined the work undertaken by ODL. Lists and details are contained in Annex 2.
Many interfacing problems were discovered when the Active Heave Compensation (AHC) was installed but all were overcome. Full stability calculations for the vessel had to be carried out to ensure that all modifications were compatible with full certification of the vessel for worldwide use.

Ancillary drilling equipment (e.g. VIT frames) and wireline winches were also refurbished. Marvin Gearhart also brought to our attention the amount of work now being done in the oilfield with coiled tubing. There are also science programmes looking into this.

6. OD21 Activities

Shinichi Takagawa summarized the present status on OD21. A contract has been let with Mitshubishi Heavy Industries for design/build work. Mitsui will build the Hull of the vessel. Annex 3 contains conceptual designs and information, all of which is provisional.

The vessel, 210m in length, will have a three-deck lab stack of approximately double the space in the Joides Resolution labs. The date of October 2003 is projected for first sea trials with a 1000m capability. Thereafter it will be progressively increased to its maximum capability. Presently there are various accommodation scenarios and plans in hand using experiences from other vessel builds and operations to ensure that thruster vibration will be reduced to a minimum. This is expected to be well below that required in the best category of the ISO 1984 regulations for shipping.

Ted Burgoyne, the newly appointed chair of the Technical Advisory Panel of IODP then outlined his activities since being appointed and stated that the role of the panel was to advise the Science committee led by Ted Moore. Details of the committee are shown in Annex 3 and Ted said that he would also be looking to TEDCOM for advice and contacts.

Initial tasks of the panel are a Review of drill ship design, management and staffing of the drill ship, evaluation of drilling costs for two scenarios (Somalia and Kerguelen) and Alternative Platforms.

A graph showing a possible management structure was also tabled.

Discussion on both talks was wide ranging and included enquiries on ship aspects (accommodation, vibration, laboratory details) and on operational matters such as what science should (or could) be done aboard the vessel or at a shore-based laboratory.

Item 7 was deferred to be included with 17 & 18

8. Active Heave Compensation (AHC) and Drill string Motion Monitoring

Brian Jonasson summarized the progress with the AHC which is now installed on the vessel, is operational, but appears to have bugs in the system which are linked to electronic noise. The commissioning engineer for the AHC has not sailed on the first leg after the drydocking.

Drill string modeling requested by TEDCOM prior to AHC installation was not undertaken, the reason given being shortage of time available to the TAMU engineer responsible. Active and Passive mode operational data can now be collected as can LWD. WOB, pump data etc will be collected on the upcoming leg. New rig instrumentation will also assist with the collection of data and real numbers on the dynamics of the whole system will be generated soon. It is not clear what can be done with those numbers if there is no model in which to fit or interpret them.

Discussion then followed on the use to which the data could possibly be put. Gearhart said that Shell had been putting a lot of effort into analyzing drilling vibration and slip-stick in order to improve bit wear, especially if using PDC bits. Skinner stated and Svendsen emphasized that torque on a drill string is one of the parameters being used at present in order to control drilling in the new generation of automated rigs. Shatto thought that the AHC plus rig floor recording would provide good data for simulation studies and that this would allow the collected data to be properly interpreted.

Moran said that it was essential to ensure that the AHC was working properly and that modeling of the data would ensure this. To this end she questioned the advisability of not carrying out the previously agreed simulation studies. However Jeff Fox stated that the simulation studies would not be dropped from their tasks.

9. Measurement While Drilling and memory Tools

Derryl Schroeder summarized the activities in this sphere and submitted papers are in Annex 4.

The formation of a Downhole Measurements Team has helped to assist in the standardization and management of downhole measurements tools and strategy. There is a tools service centre at ODP TAMU and here repairs, maintenance, trouble shooting and upgrades, if possible using common software interfaces and protocols, can be undertaken.

The Adera temperature tool is obsolete and needs to be upgraded. This is also the case with the Water Sampler tool (WSTP) and the Davis Villinger temperature and pressure tool (DVTP). The ODP development plan outlined on a sheet in Annex 5 allows all to be upgraded to common interfaces.

Regarding rig instrumentation Leg 188 will allow testing and comparison by recording and integrating downhole and surface measurement systems.

Marvin Gearhart showed electronics packaged in small configuration (1" OD) which had large memory capacity, high temperature working conditions (to 325deg F) and multi-function capability. He also showed a small three component accelerometer which is commercially available. All of this circuitry could be relevant for ODP requirements in tool upgrading.

10. Hard Rock re-Entry System (HRRS)

Leon Holloway presented the progress made on the HRRS with recent tests in Australia. Annex 5 has further details. Despite problems with the Hammer Vendors (SDS) progress had been made with Ring Bit and Under-Reamer Bit designs and, after testing, some designs were accepted, others rejected and some retained for re-design and further testing. Although the planned engineering leg was cancelled due to dry dock over-runs there will be an opportunity to run tests on leg 191E where 13 days are allocated to hammer tests.

The problems with SDS resulted in a new agreement being drawn up and this will make the leg testing cheaper despite the length of leg.

The previous vibration problems have been analyzed and steps taken to rectify them. Many of the problems in the standpipe of the derrick appear to be related to the previous method of fixing it to the derrick.

The hammer and bit, under normal mud operating conditions have a run life of approximately 24 hours. It should be possible to increase this to 40 hours if using seawater flushing.

Initial offshore tests will commence with the under-reamer bits to gain experience of them. Then the ring bits will be tried. Water depth for the tests will be 1750m.

Moran stated that this development and testing is with a view to the tool being operational for at least one programmed leg in FY 2002.

Holloway said that if the hammer development is successful it could be further extended as a smaller hammer (8.5") could also be used to set a further casing string. He also mentioned that all the hammers would have a super coating on the wear faces which will give them more durability.

Sverrir Thorhallsson mentioned that it was good to see that since the introduction of hammer technology to ODP it had only taken four years to get the system from working with other parties, on land, to ODP taking it to sea. He thought that this was a good achievement.

12. Advanced Diamond Core Barrel (ADCB)

Leon Holloway also presented the status of the ADCB, offshore testing of which should have occurred on the cancelled engineering leg. Annex 6 has details.

There are 15' and 30' versions but the 15' one is most likely to be used in order to optimize core recovery. A new latch system has been designed to allow better core barrel location prior to drilling and unlatching for wirelining after. A shock sub and circulation sub are also available to allow greater opportunity to free stuck barrels. Many of the components are ''off the shelf' stock items.

Land tests produced a high percentage of good quality core.

Tests on retractabit crowns, suggested by TEDCOM to test integrity and wear on the reduced cutting areas were made on NQ sized bits scaled in kerf and pattern to reflect larger core bits. All the tests successfully indicated that a retractabit could be expected to stand up to coring operations.

13. Other ODP Activities

13.1.New Joides Resolution Laboratory Facilities

Tom Davies gave a review of the new laboratory facilities made available by addition and refurbishing to the original laboratory stack. Annex 7 has more details.

The formation of laboratory working groups, one for each functional area, linked to SCIMP, allowed full discussion and planning of what the laboratory requirements were and how they could be met. The upgrade is thought to be a great improvement in the working environment and also gives a new conference room facility.

13.2. Leg Report

Gene Pollard gave information on previous and forthcoming legs, all of which is summarized in Annex 8. Leg 185 had the longest string deployment to date from the Joides Resolution.

There is a possibility that as well as the HRRS the ADCB and HYACE tool could be tested on leg 191.

Other items under this agenda number were dealt with under other headings during the day and the meeting adjourned.

14. Geothermal Drilling in Iceland

The next day's session commenced with a presentation by Sverrir Thorallson on a proposed deep geothermal borehole with science interest to be drilled in Iceland. The plan is to drill into the supercritical zone with temperatures up to 380deg C at 1600m downhole and a potential target depth of 3-4km. - Details of this are attached in Annex 9 and the proposal provides a good platform for technology and science advancement and is of relevance to the work being done in ODP.

15. Overview of Planning of rthe next phase of ODP

A presentation by Kate Moran giving an overview of Planning for the new phase of ocean drilling and the technical challenges still required to be met by ODP. This is summarized in the papers in Annex 10 and is essential background to the remainder of our deliberations at this meeting.

International Planning

Areas of planning are being undertaken for the remainder of ODP and the future. While ODP cannot financially support any future programme planning there are various committees or working groups which have been set up and which have ODP input and are outlined in one of the papers in annex 8..

Science planning is well-advanced and builds on CONCORD and COMPLEX meetings. Ted Bourgoyne has already outlined the tasks for the Technical working group. The Industry Liaison group is not yet up and running.

Japan

Japan has made a commitment to a riser equipped drilling ship for a future programme and the design/construction is scheduled to start in march 2000.

There is a JAMSTEC/JOI memorandum of agreement for tool development and the international working group support office.

Co-development of tools could be important and various questions were asked on how tools could be handed over between programmes. Clearly there is scope here for TEDCOM interaction also.

USA

The NSF asked USSAC to assist in developing a conceptual design for the non-riser drill ship and USSAC have formed the Conceptual Design Committee. The conceptual design committee are basing their recommendations on the outcome of the COMPLEX meeting. NSF are expected to provide guidance for the form of RFP which will be issued by December 1999 and to provide guidance on a vessel acquisition plan by April 2000.

JOI/ODP/USSSP

An ODP 'wind-down' plan is due from JOI to NSF in early 2000. JOI started an International Working Group (IWG) support office in November 1999. It has two office support staff and two Japanese representatives.

While advice and guidance on technology is still needed Moran also said that it would be difficult to justify any further developments within ODP after FY2001. In two overheads she also outlined the Technology anticipated as achieved by end FY2001 and the challenges to 2003.

There was some discussion on this which included the limited time for testing new tools, the expectation that they would work when used in 'most adverse conditions' even if this is the first trial. Svendsen said that it was not a good idea for the tool or the reputation of the tool or its developers to use it in extreme conditions as part of a test and Jonasson fully agreed with this.

16. New members for TEDCOM

A list of potential additional US members had been compiled based on information given at the previous TEDCOM meeting plus some additions since. An additional name submitted at the meeting was Roger Anderson of Mobil Exxon. However a number of those listed were unavailable or unwilling to stand once they had been contacted. Following the discussions on the previous topic it was decided that there is probably not a requirement for new members at present especially as additional expertise can be invited in for specific topics as and when they arise. The discussion highlighted the uncertainty being felt by the engineers in the existing programme coming to a close and the perception that the funding authorities would expect a new programme to burst into life from day one having allowed the expertise and momentum to dwindle in the run-up to closure of the existing programme.

At this stage the chairman called for a closed meeting as it was clear that 'end of programme' considerations were influencing the discussions while it is TEDCOM's role to ensure that this programme continues its high profile technical developments in a timely and successful manner to meet operational requirements and scientific objectives until the end of the final leg.

17. TEDCOM to the end of the ODP Programme

Skinner questioned whether TEDCOM should continue as present or whether it should act in similar fashion to the successful PPG's. There was discussion but no conclusion on this, the main feeling being that some form of core expertise would be required and should still be retained as a standing committee.

Marvin Gearhart also advised the committee of a company called NERAC who provide an internet-based search facility for locating information on any topic. It is subscription based and may be of relevance to a new committee structure.

There was a clear consensus that TEDCOM is required up to the end of the existing programme as an advisory group to SCICOM to assist in ensuring that the tools presently being developed for the programme science objectives are available by due date. If this is not done science objectives within the current programme could be compromised. Additionally, if developments which may not come to fruition in this programme are not progressed there will be a serious hiatus (if not complete loss) in certain sectors of development and possibly operations when a new programme starts up. It is incumbent on TEDCOM to point out those facts although it is up to SCICOM and the new programme structure to ensure that technology transfers as seamlessly as possible to meet the already formulated science plans of CONCORD and COMPLEX. In summary TEDCOM needs to continue working with SCICOM and ODP TAMU to ensure the following:

- That existing tools are maintained and upgraded to best effect for the science required for upcoming legs. (An ODP TAMU undertaking fully endorsed by TEDCOM)
- That the HRRS is field tested and made ready for an operational leg
- That the ADCB is field tested under normal conditions before being required to tackle 'difficult' conditions where it is seen as possibly the only thing which will work. This may require some days on appropriate science legs - an example possibly being Ontong Java.
- That MATLAB simulation studies are carried out to optimize the efficiency which can be obtained from the upgraded passive compensator and active heave compensator.
- That the AHC is commissioned quickly and effectively to ensure maximum use of an expensive upgrade so close to end of programme. If necessary an installation engineer must sail on a leg. No science time is compromised by getting it operational during normal science operations.
- That CORKS are completed for upcoming leg science in the existing programme
- That Hydrate sampling tools and temperature measurement tools are available for upcoming leg science in the existing programme
- Continuity of effort and expertise into the next programme

It was also felt that other developments should not be dropped although it would be difficult to justify them from existing ODP funds when they were not required for science envisaged to the end of this programme. An example of this is the Retractabit development which will certainly be of use to a new programme. Another example is the development of drilling memory tools which are now thought to be only of use to input data into models to improve real-time understanding of operations. Real-time drilling parameters downhole is a goal which must be pursued for the new programme but the ongoing development of memory tools for data acquisition is a legitimate development goal for this programme.

TEDCOM were worried by the suggestion that development funding be stopped or much reduced for the final year(s) of the programme and felt that this would seriously jeopardize any follow-on programme in terms of expertise and continuity which would, in any event, be made difficult by inevitable changes in the structure and content of a new programme. Additionally, although the ADCB has a good chance of success now it should be tried out once more before it is actually needed. The HRRS almost certainly will require further testing and fine tuning after its field trials and again time should be made available for this before the leg on which it is to be used and expected to work. All of these items require development time and expertise and hence a budget. Indeed some members felt that "it would not be inappropriate to have another engineering leg scheduled before the end of the programme".

TEDCOM would encourage the retention of development funds to end of programme as an incentive to keep staff who are also doing the day to day maintenance and upgrades on existing tools.

18. TEDCOM and the New Programme Advisory Structure

Given that there are restrictions on what the existing TEDCOM can do in relation to a new programme but also that an international working group has also been set up to chart a way forward TEDCOM suggests that the following topics may merit consideration.

- An 'Engineering Development Transition Strategy' needs to be explored and possibly funded outwith ODP. Inevitably there will be an hiatus in the commencement of a new programme but this may reduce the impact of lead times before science can be achieved.
- A 'Retrospective Report' on the usefulness/applicability of TEDCOM over the period of the ODP programme to assist the setting up of the new structure. Chairman of TEDCOM will canvas past and present members of TEDCOM for this.

- It was also felt that some method of transferring TEDCOM expertise to a new programme needs to be formulated - in part this is being done by having Ted Burgoyne attending TEDCOM.

19. A.O.B.

No other business was raised.

20. Date and Venue for next meeting

Early June will be canvassed once a venue has been discussed with Bill Hay (SCICOM).

TEDCOM AGENDA
College Station, Tx, USA
1 & 2 December, 1999

1. Opening Remarks - Jeff Fox, Kate Moran

2. Apologies for Absence - Alister Skinner

3. Approval of 24th TEDCOM Minutes

4. Report on the JR Dry Docking Activities -
   ODP Projects - Brian Jonasson
5. ODL Projects - Brent Shoemaker

6. Report on OD21Activities and IODP Technical Advisory Panel
   OD21 - Shinichi Takagawa
   IODP/IPSC - Ted Bourgoyne

7. What is required of TEDCOM regarding 6 above

8. Status Reports on the Active Heave Compensator and Drillstring Modeling - Brian Jonasson.

9. Measurement While Drilling, Downhole Measurements progress and plans. - Deryl Schroeder and Marvin Gearheart.

10. Hard Rock Reentry System - Leon Holloway.

12. Advanced Diamond Core Barrel - Leon Holloway.

13. ODP TAMU Activities other than above.
    1. DryDock Lab Modifications - Science Services - Tom Davies.
    2. Leg Summaries - Gene Pollard.

14. Geothermal Drilling in Iceland - Sverrir Thorallson.

15. Overview of Planning of rthe next phase of ODP - K. Moran.

16. New Members for TEDCOM - A. Skinner.

17. TEDCOM to the end of the ODP Programme - A. Skinner and Members

18. TEDCOM and the New Programme Advisory Structure - A. Skinner and Members

19. AOB

20. Venue to be discussed with Bill Hay, Date to be in June by agreement.

Fall 1999 Joint Meeting Scientific Steering and Evaluation Panels for the Dynamics of Earth's Interior and Earth's Environment

Nov. 1-3, 1999, Udine, Italy
DRAFT MINUTES

Nov. 1, CISM (International Center for Mechanical Sciences), Piazza Garibaldi 18, Udine, Italy

8:30 ISSEP Chair John Tarduno and ESSEP Chair Neil Lundberg opened the sixth Joint Meeting of the Scientific Steering and Evaluation Panel for the dynamics of Earth's Interior and Earth's Environment. After introduction of panel members the meeting host, Michele Rebesco, offered some information on local logistics of the meeting. The panel thanked Michele for organizing the pre-excursion field trip to Venice, and for his overall help in organizing the meeting.

JOIDES Office Report

Next the panel heard from Jeff Schuffert, who gave the JOIDES office report. Jeff reported on the two new Program Planning Groups (Hydrogeology and Arctic). The Hydrogeology group is well on its way to be established (offers have been made). The chair for the Arctic PPG has yet to be identified (offers have been turned down because of perceived conflict of interest).

Jeff next reviewed some proposal statistics. Thirty seven new or revised proposals were received; with one exception they were received by the deadline. The average proposal length is close to the published guidelines.

Craig Manning noted the panel's appreciation of the efforts by the JOIDES office to enforce the proposal deadlines and guidelines.

Warner Brueckmann noted that 6 proposals were submitted electronically. This may increase in the future; the SSEPs may consider receiving these as electronic (pdf) files in the future.

SCICOM Report

Alastair Robertson reviewed actions taken at the last (August) SCICOM meeting. He mentioned that the Woodlark proposal (560) was discussed. SCICOM decided not to consider it in the ranking. 19 of 25 proposals considered for ranking (6 were excluded because they were out of the area of expected operation). Alastair next reviewed the results of the SCICOM ranking (reproduced below):

523 Hotspot
465 SE Pac
486 Eocene
525 Peridotite
500 H2O
499 ION Eq. Pac.
546 Hydrate Ridge
505 MCM
534 Shatsky Rise
510 Marion Plateau
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489 Ross
553 Cascadia
451 Tonga
535 Slow spreading
477 Okhotsk
549 OMZ
478A E. Nankai A
478B E. Nankai B
355 Peru

After the ranking OPCOM proposed several scheduling options (for proposals above the line in the list above). These include scheduling into FY02. SCICOM voiced its desire to complete ION; also, they are committed for development/implementation of ACORK. The final schedule has yet to be decided.

In other news, Alastair mentioned that SCICOM would be willing to consider setting up a new biosphere PPG with a different membership and focus.

NSF Report: Jamie Allan

Jamie briefly reviewed the funding structure for the new panel members. He noted that Margaret Leinen has joined NSF (she is a prior EXCOM member). He gave a summary of the CDC (conceptual design committee), which will provide input for the design of a new non-riser ship; the US has agreed to capitalize this ship.

JOI Report: Kate Moran

Kate Moran provided a broad review of the current ODP structure and of planning for post 2003. She also discussed ongoing technology development include HYACE, and laboratory updates of the ship for deep biosphere and gas hydrates work. Kate also discussed recent meetings with industry; ideas for cooperation were well received. Craig Manning asked if this was mainly seen as a means to generate more capital for ocean drilling. Kate replied that industry had scientific objectives that could contribute to the overall effort.

She described the relationship of IPSC to other parts of the JOIDES advisory structure. IPSC has established several working groups including one to write a science plan for a new program, taking input from the COMPLEX and CONCORD meetings. Working groups for technology and industrial liaisons have also been established.

The Japanese DIET has approved over $500M for design and construction of a new riser vessel. H. Tokuyama noted that he had some updated diagrams of the new ship (these were reproduced and distributed later in a joint session).

Kate continued by explaining US activities for post 2003 drilling. She discussed the formation of the conceptual design committee by USSAC. It is hoped that the new ship will have capabilities that extend into shallow water. The work of the committee will be used as input for an RFP. The ultimate decision on the new non-riser ship will decide whether a "hiatus" in drilling occurs.

Kate discussed several outreach efforts by JOI including the ocean drilling seminar series on Capital Hill.

10:15-17:00 Separate ISSEP and ESSEP Meetings to Review Proposals

The SSEP chairs reviewed the conflict of interest rules prior to the start of proposal reviews. Proponents are excluded, as are those having active projects closely related to the projects proposed. SSEP members at the same institutions as a proponent must identify themselves to the SSEP chairs prior to review discussions.

During the meetings (Nov 1-3), the SSEPs considered the following proposals:

Proposal	Title Code	Proposal contact
477-Add3	Okhotsk paleoc.	Takahashi
482-Add4	Wilkes Land Margin	Escutia
489-Full3	Ross Sea	Barrett
512-Full2	Core Complex	Blackman
521-Full5	Indus Fan	Clift
522-Full2	Fast Deep Crust	Wilson
533-Full2	Arctic Ocean	Blackman
535-Add	735 Deep	Dick
537-Full3	Proto. Seis. Zone	Von Huene
539-Full2	Blake Ridge	Holbrook
544-Full2	Subduction Zone	Silver

545-Full2	Juan de Fuca	Fisher
547-Full	Ocean Deep Biosphere	Fisk
549-Full2	N. Arabian Sea	Von Rad
550-Full	Australia NW Shelf	Bradshaw
551-Full	Hess Deep	Gillis
553-Add	Cascadia Margin	Hyndman
554-Full2	Mexico Gas Hydrates	Kennicutt
555-Full2	Cretan Margin	Kopf
558-Pre2	Iberian Margin	Zitellini
561-Full2	Caribbean LIP	Duncan
562-Full2	N. Atl. Paleocean.	Norris
563-Pre2	Eur.American Gateway	Smolka
564-Full	New Jersey Shelf	Miller
566-Full2	Nanaki Hydrate	Matsumoto
567-Pre	S. Pacific Transect	Lyle
568-Pre	Caribbean Gateway	Droxler
569-Full	Juan de Fuca CO2	Goldberg
570-Full	Axis East Pac. Rise	Batiza
571-Full	Peru Deep Biosphere	D'Hondt
572-Pre	N. Atlantic Climate	Channell
573-Pre	Carbonate Mounds	Dullo
574-Pre	Rainbow Hydrothermal	Fouquet
575-Full	Gulf of Aden	deMenocal
576-Pre	S. Barbados Accret.	Deville
577-Full	Demerara Rise	Wilson
514-Full3	Maldives Sea Level	Droxler

In addition, External Reviews and Proponent Response Letters were considered for proposals 520, 560, 559, 519. Final decisions on these proposals are summarized in Attachment A.

19:30 Meetings of Review Working Group on Seismogenic Zone and related proposals (Sala Colombe, Astoria Hotel)

Attending:
Keith Louden*
Don Fisher
Craig Manning
Jamie Austin
Barbara Bekins
*Working Group leader

A Joint ISSEP/ESSEP Working group was established by the SSEP chairs to coordinate review of proposals in the broad area of the seismogenic zone/convergent margins. Proposals considered by the Working Group included: 537-Full3, 544-Full, 555-Full, 576-Pre

20:15 Meetings of Review Working Group on Deep Biosphere Zone (Sala Colombe, Astoria Hotel)

Attending:
Debbie Kelley*
Craig Manning
Paul Baker
Barbara Bekins
*Working Group Leader

A Joint ISSEP/ESSEP Working group was established by the SSEP chairs to coordinate review of proposals addressing the sub-seafloor biosphere. Proposals considered by the Working Group included: 547-Full, 571-Full,
573-Pre, 574-Pre

19:30 SSEP Chairs, JOIDES office and ODP Managers Meeting, Sala Rosone, Astoria Hotel

Attending:
John Tarduno (ISSEP chair)
Neil Lundberg (ESSEP chair)
Julie Morris (incoming ISSEP chair)
Kate Moran (JOI)
John Farrell (JOI)
Warner Brueckmann (JOIDES office)
Jeff Schuffert (JOIDES office)
Alastair Robertson (SCICOM liaison to ISSEP)

The group met to discuss several issues including reporting by the current and future PPGs. John Tarduno stressed that suggested revisions to the original SCICOM motions concerning PPG-chair attendance at the SSEP meetings were intended to apply to the new PPGs rather than all the current PPG (because most of the current groups have completed, or soon will complete their work). The SSEP chairs asked Warner Brueckmann and Jeff Schuffert to communicate this to Bill Hay. Julie Morris agreed to draft suggested revisions to the SCICOM motion discussing PPG meetings and reporting that are consistent with the JOIDES organization structure (i.e. PPG report to the SSEPs).

20:15 Special Meeting to Discuss Marion Plateau-Shatsky Rise Scientific Issues, Sala Rosone, Astoria Hotel

Attending:
John Tarduno (ISSEP chair)
Neil Lundberg (ESSEP chair)
Julie Morris (incoming ISSEP chair)
Jamie Austin (ESSEP)
Ellen Thomas (ESSEP)
Steve Clemens (ESSEP
Ulrich Bleil (ISSEP)
Randy Forsythe (ISSEP)
Kate Moran (JOI)
John Farrell (JOI)
Warner Brueckmann (JOIDES office)
Jeff Schuffert (JOIDES office)

On 29 Oct. the SCICOM chair Bill Hay requested that the SSEPs evaluate a drilling plan involving Proposals 510 (Marion Plateau) and 534 (Shatsky Rise) proposed by the ODP managers. Specifically, SCICOM sought the SSEP's opinion as to whether the highest priority scientific objectives could be met by the plan. Bill Hay requested that the SSEP comments be sent by 4 Nov to the JOIDES office.

In response to this request, the SSEP chairs asked several members to meet with representatives from the JOIDES office, JOI and SCICOM to discuss the plan.

Kate Moran presented the plan and its intent to maximize the overall science achieved. If both programs could be shortened, both might be incorporated into the FY01 drilling schedule.

The SSEP chairs asked Jamie Austin to provide his opinion on the impact on the science presented in the Marion Plateau proposal.

The SSEP chairs asked Ellen Thomas to provide her opinion on the impact of the plan on the science presented in the Shatsky Rise proposal.

Both reviews were followed by considerable discussion, which included other SSEP members asked to attend the meeting. After this discussion, a consensus was reached. The chairs asked Steven Clemens to draft a consensus statement for consideration during the joint ISSEP-ESSEP meeting. Furthermore, the SSEP chairs asked Jamie Austin and Ellen Thomas to prepare statements reflecting their opinions on the science that could be obtained in the plan with respect to Marion Plateau (Jamie Austin) and Shatsky Rise (Ellen Thomas). The SSEP chairs thanked everyone for their patience, with the meeting concluding at approximately 23:00.

Nov 2. 8:30-18:00 Separate meetings of ISSEP and ESSEP to continue reviewing proposals.

In addition to separate meetings for proposal review, two additional Review Working Groups met to coordinate ISSEP/ESSEP comments:

Gas Hydrates Working Group

Attending
Jon Martin*
Paul Baker
Gerard Blanc
Julie Morris
Nathan Bangs
*Working Group leader

This group was established by the SSEP chairs to coordinate review of proposals addressing gas hydrates. Proposals considered by the Working Group included:: 539-Full, 553-Full, 554-Full, 566-Full2

Climate-Tectonic Links Working Group

Attending:
Steve Clemens*
R. Tada
Ulrich Bleil
Randy Forsythe
*Working Group leader

A Joint ISSEP/ESSEP Working group was established by the SSEP chairs to coordinate review of proposals addressing climate and tectonics.
Proposals considered by the Working Group included: 521-Full5, 533-Full2, 563-Pre2, 568-Pre

18:30 Reception, University of Udine, Palazzo Florio, Via Palladio 8 Udine

20:00 Panel Meeting Dinner, Hotel Astoria, Piazza XX Settembre 24 Udine

Nov. 3.

8:30 Separate Panel Meetings

ESSEP Meeting

ESSEP required the balance of this session to complete discussions on the remaining proposals. In addition, there was discussion on SCICOM rankings of proposals at the August 1999 SCICOM meeting. In particular, discussion was sparked by questions that arose during review of proposals 477 (Okhotsk and Bering Seas) and 549 (Arabian Sea OMZ and Monsoons). A number of ESSEP members considered these to be high-priority proposals, and watchdogs felt they had insufficient information about why these were ranked low by SCICOM to be able to convey useful suggestions to proponents.

ISSEP Meeting

John Tarduno reviewed the status of priorities discussed previously by the panel, in light of recently scheduled programs. The following is a brief summary of this review.

Mantle Dynamics: The recent selection of ION and LIP proposals, together with previously scheduled legs addressing mantle flow (i.e. AAD) forms a coherent effort to address geodynamics, ranging from the present day to the Cretaceous. LIP legs have been exploratory.

The next phase of drilling should build on these efforts, and be geared toward specific hypothesis testing.

Oceanic Lithosphere: The AOL PPG, and reports from prior planning meetings, have outlined several areas of progress desired in the general area of oceanic lithosphere. These include plutonic foundations, complete penetration of insitu crust, hydrothermal systems and core complexes. ISSEP has seen proposals in all of these areas and legs will address specific items (e.g. Manus Basin hydrothermal systems).
However, a plan to link specific proposals has not been produced by prior planning groups and ISSEP might consider attempting to draft such a plan (or plans). Also, the panel should be aware that it's desire to see an Oceanic Core Complex drilled prior to the end of the present program is a priority that did not appear in SCICOM's subsequent discussion of program priorities (that was communicated to EXCOM.)

Mass Balances and Temporal variations at subduction zones: The panel had previously expressed the desire to see an effort drilled before the end of the present program to complement previously scheduled legs (i.e. Leg 185) ; there appears to be sufficient proposal pressure in this area.

Convergent Boundaries: There has been considerable advance in this area with 2 scheduled legs at Nankai. The original intent of these proposals was to study processes of deformation and fluid flow in the accretionary wedge. The panel will need to consider how this relates to the seismogenic zone drilling given priority at CONCORD (use of the new riser drill ship).

Extensional Boundaries: The chair noted that the lack of proposals in this area is not surprising; the panel previously requested that a program planning group be established to represent this area because of a perceived lack of proposals.

Earthquake processes: ODP has made considerable advances in this area with the recent instrumentation of the Japanese trench (ODP Leg 186). The chair noted that we hadn't been receiving many other proposals of this type and that the panel might consider soliciting additional proposals.
Jamie Allan noted that the principal reason for the lack of proposals was probably the lack of cables that could service new installations. Jamie noted that new installations in the northeast Pacific might lead to new proposals.

10:45 Joint ISSEP/ESSEP Meeting

ODP-TAMU Report

Paul Wallace and Mitch Malone of ODP-TAMU provided a brief summary (results of recent legs have been linked to the SSEP web site, www.earth.rochester.edu). Paul reviewed developments during the recent drydock. The ICPE (Inductively Coupled Plasma Emission Spectrometer) will be installed prior to Leg 187. Debbie Kelley asked about pressurized water samples for biosphere studies. The ODP-TAMU liaisons will provide more information on this issue to the SSEPs.

Logging Report

Tim Brewer briefly asked for feedback regarding the development of new logging tools (descriptions have been posted on the SSEP web site, www.earth.rochester.edu/issep). The SSEP chairs agreed to provide feedback on these new tools.

PPG Reports:

SWS PPG Presentation by Terry Quinn

Terry Quinn, co-chair of the SWS PPG, reviewed the progress and goals of the PPG. Terry provided the group with a report addressing scientific issues (white papers) which have been posted on the SSEP web site (www.earth.rochester.edu). Terry reviewed the challenges that the SWS-PPG has faced. Shallow water science requires alternate platforms or a reconfiguration of the JOIDES Resolution. Terry reviewed the timeline of the PPG work and a science/technology matrix. Terry's presentation was followed by questions and comments. Jamie Austin noted that

the project planning should be incorporated into IODP. Paul Baker was surprised that only 2 main scientific issues were identified in the report/ white papers; he felt there were many more important issues. Peter Demenocal felt the community was mature scientifically but was technology limited. The SSEP chairs thanked Terry for the update and noted that the panels were beginning to see increased proposal pressure in the area of shallow water systems.

Gas Hydrates PPG Jon Martin

Jon Martin provided a comprehensive review of the Gas Hydrates meeting held in September, 1999 in Berlin. The meeting addressed two major themes: (1) technical aspects of gas hydrates (status of existing tools, development of new tools, needs for new tools involving sampling and geophysical tools) and (2) prioritizing the most important issues (developing a drilling strategy and identifying type areas to target).

Jon reviewed existing tools or those under development including HYACE, the Pressure Core Sampler (PCS), The Davis/Villenger Temperature Probe (DVTP), the Water Sampler Temperature Probe (WSTP), and the Fissler Water Sampler (FWS). Jon also discussed some new tools including the TCP device under development by Charlie Paull to measure pressure and temperature and electrical resist. on the piston head of the APC device. This might allow measurements on every APC run. Jon also discussed a catwalk IR temperature sensor gun. This might develop into a routine measurement on cores.

Jon noted that the PPG was pleased with the selection of Hydrate Ridge for scheduling. Hydrate Ridge will address tectonic BSRs through drilling in an active margin setting. The group discussed what might be missing from the Hydrate Ridge effort that is still important for an overall approach to understand hydrates. Items discussed included slope stability, hydrate-climate links, importance of hydrates in a passive margin setting, gas chemistry and thermogenic vs. biogenic gas, destabilization of gas hydrate and non- BSR hydrates. For non-BSR hydrates, the group considered several options, with input from Jon and John Tarduno who also attended the meeting. These included APL's that might propose specific studies that could be done on legs addressing other topics but drilling in locations where non-BSR hydrate might be expected. In addition, routine techniques to identify gas hydrates were discussed (such as collection of catwalk temperatures).

Some PPG members were reluctant to suggest specific strategies that would follow the Hydrate Ridge Drilling but did express that the link between slop stability/geohazards and climate was perhaps the most important remaining issue.

The SSEPs have received a final report from the PPG which discussed this and other issues; the report has been made available to SSEP members through the SSEP web page (www.earth.rochester.edu/issep).

12:00 Lunch Break

13:00 Continuation of Joint ISSEP-ESSEP Meeting

The panels thanked Piera Spadea for her work in the planning of the meeting.

Marion Plateau-Shatsky Rise Plan

Next the panels addressed the Marion Plateau-Shatsky Rise plan proposed by the ODP Managers. A discussion of this plan was requested by Bill Hay.

The SSEP chairs asked Jamie Austin to start by reviewing what high priority science would be accomplished from the original Marion Plateau proposal in the ODP Managers plan. The SSEP chairs asked Ellen Thomas to follow Jamie's presentation with a similar review with respect to the Shatsky Rise proposal. Next, the SSEP chairs asked Steve Clemens to present a draft SSEP consensus statement on this issue. This statement represents the outcome of a meeting held in the evening on 1 Nov (see above). The SSEP chairs then asked the opinion of other SSEP members who were asked to attend the 1 Nov. meeting (Ulrich Bleil and Randy Forsythe). After adopting some minor changes in wording the consensus statement was adopted by the SSEPs The SSEP chairs thanked Jamie Austin, Ellen Thomas and Steve Clemens for their presentations.

Attachments B & E are the written reports of the SSEP deliberations on the Marion Plateau-Shatsky Rise discussions, sent on Nov. 4, 1999 to the JOIDES Office. Attachment B is a cover letter from the SSEP chairs on the Marion Plateau Shatsky Rise deliberations; Attachment C is the Marion Plateau Shatsky Rise Consenus Statement from the SSEPs; Attachement D is a Marion Plateau review statement, written by ESSEP watchdog Jamie Austin; and Attachment E is a Shatsky Rise review statement, written by ESSEP watchdog Ellen Thomas.

Presentation of SSEP Motion by Julie Morris

A series of recommendations to SCICOM were presented by Julie Morris. These recommendations were in part stimulated by events following the last SCICOM meeting including handling of the Marion Plateau and Shatsky Rise proposals. After discussion and minor revision the issue was called to a vote by Hans Brumsack; seconded and approved unanimously. The motions are found in Attachment F.

Discussion of Joint Proposals: Review Working Group Leaders

After another review of the conflict of interest rules, the following Review Working Groups Leaders provided a brief summary of the groups discussion and final recommendations regarding the proposals considered:

Gas Hydrates: Jon Martin
Seismogenic Zone: Keith Louden
Climate-Tectonics: Steven Clemens
Deep Biosphere: Debbie Kelley

Acknowledgments

ISSEP and ESSEP thank Michele Rebesco, Piera Spadea and Angela Marchetto for organization of the meeting, Rosanna Giaquinta for leading the pre-meeting excursion to Venice, and Marco Stefani for leading the post-meeting excursion to the Dolomites.
The SSEPs warmly acknowledge the leadership of Ted Moore during the establishment of the new JOIDES review structure. Ted's keen insight into all aspects of the past, present and future drilling programs has been invaluable to the advisory structure, proposal proponents and the ocean science community. Ted's leadership as IPSC chair has already provided great encouragement to us all.

The SSEP chairs acknowledge the dedication of the following members whose service during the establishment of a new proposal review structure ensured the continued success of the Ocean Drilling Program:
Jon Martin, especially for stimulating interest in hydrogeology;
Jamie Austin, especially for assisting in sealevel proposals and his work with the ANTOSTRAT group;
Peter deMenocal, especially for assisting in proposals addressing climate-tectonic links;
Ellen Thomas, especially for assisting in issues of past warm climates;
Rainer Zahn, especially for assisting with paleoceanographic issues;
Gerald Blanc, especially for assisting with the reviews of proposals in fluid flow and convergent margins;
Ulrich Bleil, especially for assisting with the reviews of proposals addressing climate-tectonic links;
Georges Ceuleneer, especially for assisting with proposals addressing oceanic lithosphere;
Randy Forsythe, especially for assisting with climate-tectonic issues;
Keith Louden, especially for his seismic expertise addressing a wide range of SSEP topics;
Craig Manning, especially for his keen geochemical insight concerning a wide range of SSEP issues;
Carolyn Ruppel, especially for her insight and considerable effort in leading reviews of gas hydrate proposals for both panels;
Debbie Kelley, especially for providing key advice on fluid flow, the deep biosphere and the construction of oceanic lithosphere;
Julie Morris, especially for her geochemical insight in the evaluation ofconvergent margin proposals; special thanks also for her willingness to continue service as the new ISSEP chair;
Nathan Bangs, especially for his seismic expertise and advice on convergent margin and gas hydrate proposals.

15:15 The meeting was called to a close by the SSEP chairs.

15:30 Several panel members completed reviews.

18:00 John Tarduno and Neil Lundberg completed the summary of the Marion Plateau - Shatsky Rise discussion for e-mail submission to the JOIDES office (and subsequent distribution to SCICOM) to meet the deadline by Bill Hay. Special thanks to Warner Brueckmann for his assistance in completing and distributing the SSEP consensus statement.

Meeting Attendees

ISSEP

Nathan Bangs
Mike Bickle
Ulrich Bleil
Georges Ceuleneer
Randy Forythe
Don Fisher
Debbie Kelley
Annakaisa Korja
Keith Louden
Craig Manning
Julie Morris
Chris Small
John Tarduno (Chair)
H. Tokuyama
Z. Zhou

ESSEP

Jamie Austin
Paul Baker
Barbara Bekins
Svante Bjork
Gerard Blanc
Hans Brumsack
Chris Charles
Steven Clemens
Peter deMenocal
Hui-Ling Lin
Neil Lundberg (Chair)
Jon Martin
Ryuji Tada
Ellen Thomas
Juergen Thurow

Liaisons and Guests

Tim Brewer ISSEP Logging Liaison
Ulysses Ninneman ESSEP Logging Liaison
Robert Whitmarsh SSEP Liaison to ISSEP
Al Hine SSP Liaison to ESSEP
Alastair Robertson SCICOM Liaison to ISSEP
John Farrell (Monday-Tuesday) JOI
Kate Moran (Monday-Tuesday) JOI
Jeff Schufert JOIDES office
Warner Brueckmann JOIDES office
Terry Quinn Shallow Water System PPG co-chair

Attachments:

A. SSEP Decisions on Proposals Reviewed

B. SSEP chair cover letter on Marion Plateau-Shatsky Rise Discussions

C. Marion Plateau - Shatsky Rise Consenus Statement

D. Marion Plateau review statement (Jamie Austin)

E. Shatsky Rise review statement (Ellen Thomas)

F. SSEP motion to SCICOM

Attachment A: SSEP Decisions on Proposals Reviewed, Nov. 1999

Joint ISSEP/ESSEP Reviews and Proposal Decision

514-Full3	Maldives	External Review
521-Full5	Indus Fan	SCICOM
533-Full2	Arctic Ocean	External Review
537-Full3	Protoseis	External Review
539-Full2	Blake hydrates	External Review
544-Full2	Costa Rica	External Review
545-Full2	JdF Fluid Flow	External Review
547-Full	Deep Biosphere	Revise
553-Add	Cascadia hydrates	Revise
554-Full2	GofM hydrates	Revise
555-Full2	Crete	External Review (cover letter needed by Dec. 20)
558-Pre2	Iberia tsunami	Dev. Full Proposal with reservations
566-Full2	Nankai hydrates	External review (Revised by Dec. 20)
568-Pre	Car. Gateway	Revised preproposal
569-Full	CO2 Seq.	Revise
571-Full	Peru biosphere	External Review
573-Pre	Carb. Mounds	Develop Full Proposal
574-Pre	Perid. Hydroth.	Develop Full Proposal
576-pre	Barbados	Revised or new preproposal

ESSEP-only Reviews and Proposal Decisions:

477-Add3	Okhotsk Paleoc	SCICOM
482-Add4	Wilkes Land Margin	SCICOM
489-Full3	Ross Sea	SCICOM
519-Full2	Tahiti Sea Level	SCICOM
549-Full2	Arabian Sea	SSEP comments
550-Full	Australia NW shelf	Revise
559-Full	Walvis Extreme Climates	SCICOM
562-Full2	N. Atlantic Paleocean.	Revise
563-Pre2	EurAmerican Gateway	new preproposal only if proponents are added
564-Full	New Jersey Shelf	External Review
567-Pre	S. Pacific Transect	Dev. full proposal
572-Pre	N. Atlantic Climate	Dev. full proposal
575-Full	Gulf of Aden	Revise
577-Full	Demerara Rise	External Review

ISSEP-only Reviews and Proposal Decisions:

512-Full2	Core Complex	External Review
520-Full	Kyushu-Palau ridge	SCICOM
522-Full2	Fast Spreading	External Review
535-Add	735B Deep	SCICOM
551-Full	Hess Deep	External Review
560-Full	Woodlark	SCICOM
561-Full2	Caribbean LIP	Revise
570-Full	EPR	External Review

Attachment B: SSEP chair cover letter on Marion Plateau-Shatsky Rise Discussions

Explanation for the Leg 194 Plan comments from the SSEPs

At the request of SCICOM, the SSEPs considered the Leg 194 plan. Comments were limited to the likelihood of achieving high-priority science objectives of the original science plans outlined in Proposals 510 and 534. Comments regarding the process will be forwarded to SCICOM separately as part of the SSEP minutes.

Three files have been submitted to the JOIDES office directly from our meeting in Udine to meet the requested Nov. 4 deadline. These include:

1. A short summary of the consensus of the two SSEPs

2. Specific comments from Marion Plateau watchdog Jamie Austin. These comments were solicited by the SSEP chairs and reflect a watchdog rather than a consensus view.

3. Specific comments from Shatsky Rise watchdog Ellen Thomas. These comments were solicited by the SSEP chairs and reflect a watchdog rather than a consensus view.

Respectfully submitted,

Neil Lundberg

John Tarduno

Attachment C: Marion Plateau - Shatsky Rise Consenus Statement

SSEPS Consensus

Shatsky Rise

The Leg 194 drilling plan meets a significant number of the highly ranked Paleogene objectives which are consistent with climate change components of the ODP Long Range Plan. Highly ranked objectives of Shatsky Rise Proposal 534 which could be addressed by the Leg 194 plan include those related to (1) the Eocene-Oligocene green-house to ice-house transition, (2) the nature and onset of middle Eocene cooling, (3) ocean temperature, chemistry, and biotic response to the early Eocene warm episode, (4) carbonate dissolution and hydrate instability during the late Paleocene thermal maximum, (5) biotic effects and oceanic productivity collapse at the K/T boundary, and (5) middle Maastrichtian extinctions, circulation, and sea level change. High-priority science objectives of Proposal 534 which are totally eliminated from the Leg 194 plan are those related to the onset of the mid-Cretaceous greenhouse climate and Cretaceous evolution of marine plankton and benthos.

Marion Plateau

The Leg 194 drilling plan seriously jeopardizes the high-priority sea-level timing and amplitude objectives and eliminates the rate-of-change and facies-response objectives, all of which are consistent with the goals of the ODP Long Range Plan. Recovery of sufficient material from specific horizons at multiple locations throughout the Proposal 510 transect is critical to evaluating sea-level timing and amplitude, as well as sea-level rate of change and facies response. Given the difficulty anticipated in recovering coarse-grained carbonate clastics (especially at the more proximal locations) as well as interbedded pelagic units, there is significant concern that elimination of one or more holes at multiple sites as well as the elimination of sites CS-03, 08, and 09 significantly reduces the likelihood of recovering these critical intervals.

Attachment D: Marion Plateau review statement (Jamie Austin)

(from Jamie Austin, ESSEP watchdog for Proposal 510, 11/3/99)

Marion Plateau

A meeting of the SSEPs chairs and Marion / Shatsky watchdogs, together with representation from JOI and SCICOM, met on 1 November to consider proposed changes to the two affected science programs, with a view to scheduling parts of each as Leg 194.

Following is a site-by-site assessment of the Marion Plateau transect for Neogene sea level history. The conclusion is that the transect as originally proposed by the proponents cannot be cut, as proposed by ODP managers, to accomodate its inclusion with a Shatsky Rise mini-leg as a composite Leg 194.

The scientific premise of the Marion Plateua transect is that sequential growth of two Miocene carbonate platforms (older: MP2; younger: MP3) atop a stable and subsiding basement substrate can be used to constrain a part of the Miocene eustatic sea-level history.

CS-01A
Objective:
1) date the onset of growth of MP2;
2) date the drowning of MP2.
Proponents: propose multiple holes to a TD of 500 mbsf
Leg 194 plan: unchanged, except the 194 plan recommends only RCB coring and a combined washing and sampling program below 300 mbsf. While the Leg 194 plan recommends sampling basement, the proponents' plan targets the basement/sediment interface, to ascertain the initiation of growth of MP2. That goal cannot be abridged; continuous coring over the entire interval is recommended. No reduction in proposed site time.

CS-02A
Objective:
1) sampling of proximal flank facies of the MP2 platform, to basement.
Proponents: propose multiple holes to a TD of 450mbsf to assess both the age and paleobathymetry of flank deposits.
Leg 194 plan: use of the MDCB or ADCB in a single hole to TD.
Recommmendation: leave the proponent plan in place; optimal recovery is critical for the age/paleobathymetry objectives. These objectives are critical to the overall goal of assessing the history of the growth and presumed drowning of MP2.

CS-03A
Objective:
1) Sample flank deposits of MP2 in a downdip position, and
2) sample basinal deposits ("Megasequence C") deposits in part derived from the (younger) MP3. Paleobathymetry + age !
Proponents: propose multiple holes to a TD of 500mbsf to basement.
Leg 194 plan: eliminate this site.
Recommendation: leave the proponents' plan in place. Multiple penetrations + logs are necessary to assure a complete geologic history of the growth of MP2, and its stratigraphic relationship with (younger) MP3.

CS-04A
Objective:
1) Assess age control in the central basinal position between platforms MP2 and MP3.
Proponents: multiple holes to a TD of 600mbsf (to and through basement).
Leg 194 plan: unchanged, except that site time is reduced from 8.6 to 7.7 days.
Recommendation: leave the existing plan in place; adjust total site time as appropriate.

CS-05A
Objective:
1) sampling of proximal flank facies/deposits of the MP3 platform, to basement (including a wedge-shaped basal accumulation, "C2", that may represent the first clastic products of MP3).
Proponents: propose multiple holes to a TD of 500mbsf, to basement.
Leg 194 plan: use of the MDCB/ADCB in a single hole to TD, with only spot sampling below 300mbsf, to basement.
Recommendation: leave the proponent plan in place; optimal recovery is critical for age/paleobathymetry objectives. These objectives are critical to the overall goal of assessing the growth and presumed drowning of MP3.

CS-06A
Objective:
1) date the onset of growth of MP3,
2) date the drowning of MP3.
Proponents: propose multiple holes to 550mbsf.
Leg 194 plan: recommends only RCB coring to the same TD, with a reduced site time.
Recommendation: the interfaces at the crest and base (poorly imaged) of MP3 are critical. Multiple holes will be necessary; this site could be shortened not to include the basement target; if CS-05A is successful in reaching the basement objective.

CS-08A (CS-07A on my cross-section?)
Objective: see CS-06A
Proponents: multiple holes to a TD of 600mbsf.;
Leg 194 plan: eliminated.
Recommendation: this site might be eliminated, if the multi-hole strategies proposed by the proponents at CS-05A and CS-06A are successful.

CS-09A (CS-08A on my cross-section?)
Objective: compare proximal flank deposits of MP-3 (thicker on this flank of MP-3) with results at CS-05A.
Proponents: multiple holes to a TD of 570 mbsf, including basement.
Leg 194 plan: eliminated
Recommendation: flank deposits proximal to MP-3 differ seismically on its two flanks. In order to constrain the growth history of MP-3 completely, both CS-05A and CS-09A will be neccessary.

Attachment E: Summary of ODP Managers' Leg 194 Plan with respect to Proposal 534
by Ellen Thomas, ESSEP Watchdog for Proposal 534

PROPOSAL 534, SHATSKY RISE
LRP: EXTREME CLIMATES

Objectives that could be met in minileg (Leg 194 Plan).
Note: Double APC does not guarantee full recovery at composite section, but recovery at Site 577 and Site 865 suggests that there is a good probability.

1) Eocene - Oligocene Greenhouse to icehouse transition
-Establishment of large icesheets on Antarctica.
-Ocean temperature, chemistry; effects on biota; records of late Eocene impacts.

2) Nature and onset of mid Eocene cooling.
-Ocean temperature, chemistry, biota

3) Early Eocene warm episode:
-Ocean temperature and chemistry stability.
-Were there multiple hyperthermals?
-Biota during warm period.

4) Late Paleocene thermal maximum:
-Vertical extent of carbonate.
-Dissolution; gas hydrate dissociation.

5) K/T Boundary
- Effects on biota by depth.
- Productivity collapse.

?6) Mid-Maastrichian extinction
-Change in circulation
-Sea-level change

Objectives dropped from leg (dropped from Proposal 534):

-Timing and nature of onset of mid-Cretaceous greenhouse
-Early evolution of marine plankton and benthos
-Cretaceous Sr. isotope stratigraphy

Site-by-site strategies:

Shatsky Rise - as SCICOM received it

Primary Sites	Water Depth	Sediment Thickness	Leg 194 strategy	Drilling time(hrs)	Logging time(hrs)
SHAT 1	2400	250	**(250)**	4.3	1.2
SHAT 2	2746	375		5.9	1.2
SHAT 3	3863	600		4.5	1.2
SHAT 4	3300	275	**(275)**	5.0	1.2
SHAT 5	3100	345		5.4	1.2
SHAT 7	4125	257	**(200)**	4.6	1.2
SHAT 8	3688	168		3.9	1.2

Proposal 534 strategy: triple APC,XCB, RCB, PDC bit

Minileg Drilling Plan Strategy: Double APC
Recovers to Paleogene or Maastrichtian

-Latitudinal Range:	32°.65'N to 37°00'N
-Depth Range:	1400-4125 m
-Paleolatitude Paleogene:	16°-20°N
-Paleodepth Range:	(?) 1000-2700 m

Attachment F: SSEP motion to SCICOM

The following motion, pertaining to communication between SCICOM and the SSEPs, was put forward by Julie Morris, duly seconded and passed unanimously in the final joint session of ISSEP and ESSEP.

Resolution:
Timely and effective communication amongst SCICOM, the JOIDES office and the SSEPs is essential if the SSEPs are to fulfill their mandate to nurture proposals. Exceptional job performance by JOIDES office representatives, SCICOM liaisons to the SSEPs and SSEPs panelists cannot substitute for effective procedures that facilitate communication. Therefore, the SSEPs make the following recommendations:

1. For proposals not ranked or below the line at SCICOM's August meeting, letters to proponents should be drafted by SCICOM watchdogs at the SCICOM meeting, and copied to the SSEP chairs and the rest of SCICOM within one week of the meeting.

2. Minutes from the SCICOM scheduling meeting should be made available to the SSEPs at the earliest opportunity, and not later than the proposal deadline following the August meeting.

3. We strongly urge that the science plan and resulting ship schedule be finalized shortly after the August SCICOM meeting.

4. If SCICOM requests SSEPs input in finalizing the science plan after the August meeting, the first point of contact should be the SSEP chairs. The JOIDES office must respect the responsibility and suitability of the SSEP chairs in choosing leaders for SSEP discussion.

5. Attendance by SCICOM liaisons to both panels at all meetings is essential to the SSEPs role in nurturing proposals. SCICOM should establish procedures to ensure effective liaison.

6. The SSEPs greatly benefit from the presence of the SCICOM chair at panel meetings.

Seismogenic Zone Deep Drilling and Measurement

Report of Detailed Planning Group

JOIDES, Ocean Drilling Program,

August 6, 1999

R.D. Hyndman

SUMMARY

Most of the world's great earthquakes and tsunamis are generated by rupture on the "seismogenic zone" of subduction thrust faults. An important project in future scientific ocean drilling, especially of the OD21 riser ship scientific program, is to drill through and make detailed measurements and recording in the parts of subduction thrust faults that generate great earthquakes. The objectives are an improved understanding of the physical and chemical processes responsible for earthquakes, and seismic hazard reduction for the very destructive great earthquakes that occur on these faults. Some of the important questions are:

1. What controls the earthquake cycle of elastic strain build-up and sudden rupture: stress, pore pressure and chemical changes?
2. Are there changes with time, of stress, pore pressure, pore fluid chemistry or other parameters that define times of increasing probability of great earthquakes?
3. What controls the parts of subduction thrusts that are seismic and aseismic, especially the seaward updip and landward downdip limits?
4. What is the nature of asperities on the megathrust fault that are inferred to be stronger and generate large earthquake slip compared to areas that may have significant aseismic creep?
5. What is the nature of "tsunami earthquakes"? Why do some large slip events have most stress release in the seismic motion of great earthquakes, whereas others have slower slip that generates only moderate earthquakes but large tsunamis?

The SEIZE Detailed Planning Group (DPG) addressed mainly scientific questions, but there was extensive discussion of the technical capabilities required to meet the scientific objectives, and of likely technical limitations to drilling and measurement.

Several previous workshops and reports dealt with studies of the subduction seismogenic zone in general [1]. Important relevant information also is found in the proposal for drilling the San Andreas Fault [1] and the German KTB well [1]. This report of the DPG deals primarily with drilling by the OD21 riser drill ship, especially the first phase in the Japan area. However, shallower penetration drilling by the present JOIDES Resolution and future non-riser drill ships was also considered. Transects across subduction zone margins including deep riser holes and shallower non-riser holes near the trench are needed to meet the scientific objectives. A drill ship with a riser that allows return circulation and sealing the hole during drilling is necessary both for deep drilling and for the required extensive downhole measurement and recording, especially, (a) to allow circulation of drill mud and thus maintain hole stability in unstable overpressured accretionary prism sediments; (b) to provide ready and long-term access to the borehole for larger instruments. It is noted that at least as important as the possibility of greater hole depth with OD21 compared to the JOIDES Resolution are:

1. The increased hole stability possible by circulation of drilling mud,
2. The balancing of formation pressure with mud weight, especially where overpressured,
3. The blowout preventer for drilling areas that may contain hydrocarbons,
4. The continuous cuttings sample return, and much higher quality core,
5. The much higher quality downhole geophysical logs because of constant diameter (gauge) hole that is possible through stabilization by drilling mud,
6. The access to the hole through large diameter casing pipe; i.e., for larger diameter logging tools, instruments and experiments that are not possible on the JOIDES Resolution.

The planned OD21 riser drill ship has an initial capability of 2,500 m water depth (i.e., riser length), to be extended in later development phases, and a 10,000 m drill string. The first OD21 drilling is to be in the Japan area; initial study shows that most sites around Japan where the water depths are less than 2,500 m, require over 5 km penetration to the seismogenic zone. Such penetration involves potential technical difficulties and drilling times of several years. However, several sites off SW Japan (Nankai Trough) appear to require less penetration although they may have atypical structure. Careful study is needed to find suitable sites requiring the minimum penetration to reach the seismogenic zone. The search for the best initial site will require additional

2D and 3D multichannel and other seismic data. The formation expected to be penetrated off SW Japan is a young clastic accretionary sedimentary prism. The main technical concerns for drilling the subduction thrust and seismogenic zone are (other hazards are noted below): (a) difficult formation conditions, i.e., unconsolidated unstable sediments, high formation pressure, and high temperatures; (b) storms, especially typhoons, (c) strong ocean currents, such as the Kuroshiro current along most of the Nankai Trough. Careful engineering design, and planning are needed to deal with the typhoons and strong currents. Additional thermal data and modelling, geotechnical studies etc. are needed to predict and design for the formation conditions in a deep accretionary prism borehole.

The planning and scientific operations for long duration OD21 programs will be very different from the 2-month drilling leg experience of ODP/DSDP. The DPG recommends that an expert scientific team be set up for each major OD21 program such as SEIZE to develop detailed scientific and operational plans, and to carry through to the scientific program onboard the ship during drilling and measurement. The team should have subgroups for each of the main scientific components, including the required site surveys and studies. The scientific team must work closely with the JAMSTEC drilling engineering and science groups who are responsible for design, construction and operation of the OD21 drill ship. An outline of the proposed scientific team needed for a SEIZE drilling and measurement program is given below. It may be appropriate to have an initial competition for the most qualified and most motivated participants based upon proposals for each component of the project (about 5 scientific components). These proponents then would prepare detailed science plans for their part of the scientific program. A small committee with representation from all of the components would provide oversight to the science for the whole SEIZE project. It is desirable for the critical aspects of the project to be funded together, including the most critical site surveys. Independent funding should be only for site surveys, associated science, and those parts of the program that are not essential to the overall success of the project.

Although core and cutting sampling are important to the SEIZE program, the deep drilling should be considered primarily as a method of access to the seismogenic zone, allowing a wide range of measurements and long-term recording. The borehole is an observatory. Many of the scientific objectives can be achieved only through a comprehensive and well prepared downhole measurement

and recording program. The most important sampling, measurement, and recording programs are outlined below; they include: (1) geophysical and geological site characterization studies, (2) measurements on core and cuttings, (3) analysis of fluid and gas samples, (4) downhole measurements, (5) fault zone long-term monitoring.

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(1) The Seismogenic Zone Experiment (SEIZE) Workshop, Waikoloa, Hawaii, June 3-6, 1997 (http://www.soest.hawaii.edu/margins/SEIZE.html); The International Conference on Cooperative Ocean Riser Drilling (CONCORD), Tokyo, Japan, 22-24, 1997 (http://www.jamstec.go.jp/jamstec/OD21/CONCORD/state.html); Costa Rica - Nicaragua Seismogenic workshop report CriNiSEIZE; Scientific Drilling into the San Andreas Fault at Parkfield, CA: Project Overview and Operational Plan (http://pangea.Stanford.EDU/FZD/).

Seismogenic Zone Deep Drilling and Measurement
Report of Detailed Planning Group
JOIDES, Ocean Drilling Program

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Numerous other people contributed as replacements for DPG members unable to attend some meetings, as outside contributors at meetings, and by providing important information. These included: H. Kinoshita, S. Hickman, K. Suyehiro, S. Lallemant, M. Yamano, M. Ando, and S. Takegawa and others from JAMSTEC engineering and technical staff.

The Detailed Planning Group met three times: (1) San Francisco California, U.S.A., December 5-6, 1998; (2) JAMSTEC offices, Tokyo, Japan, 17-20 March, 1999; (3) at the Pacific Geoscience Centre, Geol. Survey Canada, Victoria Canada, 24-25 May, 1999. Initial general input from the scientific community was solicited as letters of intent. The members of the DPG were selected in part from these letters of intent.

A. MANDATE OF THE SEIZE DETAILED PLANNING GROUP (SEIZE)

The mandate of the SEIZE DPG was to advise the JOIDES Scientific Committee and other planning groups on:

1. Scientific objectives of subduction seismogenic zone drilling.
2. Drilling, sampling, downhole measurements and downhole recording that are required to meet the objectives.
3. Site requirements for such a drilling program; targets for (a) general requirements, (b) Japan area for initial drilling.
4. Site surveys and associated scientific studies needed for proposed sites, including science and safety issues.
5. Drilling technologies, facilities, downhole measurements, sampling, and long-term monitoring that will be required.
6. To solicit and encourage subduction thrust drilling (riser and non-riser) and measurement proposals, site surveys, and associated seismogenic zone studies.

B. SCIENTIFIC OBJECTIVES

The primary scientific objectives for subduction thrust seismogenic zone drilling resulting from DPG discussions are:

1. *What are the controls of the great earthquake cycle?*

Three factors may control the development with time toward the earthquake rupture, and the rupture process, (a) buildup of shear stress, (b) buildup of pore pressure that reduces the normal stress and thus frictional strength, (c) chemical and physical changes that may strengthen (or weaken) the fault zone and inhibit (or stimulate and activate) rupture. Measuring and understanding these parameters and monitoring changes with time may allow time dependent hazard assessment.

2. *What controls the updip and downdip limits of great earthquake rupture?*

The updip seaward few 10's of km of subduction thrusts are commonly found to be aseismic. Subduction thrusts also are aseismic below a downdip limit that occurs at depths ranging from 10

to 40 km. The accurate definition of these limits is important for estimating the ground shaking expected at land sites from great earthquakes. Some factors that may control these limits are, (a) temperature-induced mineralogical phase changes such as dehydration of stable sliding clays, and higher temperature metamorphism, (b) temperature-induced changes in deformation mechanisms controlling the brittle to ductile transition, (c) time-dependent changes in consolidation and fluid pressure increase with depth, (d) downdip changes in gross lithologic and mechanical properties of the fault zone, such as reaching the landward limit of accreted sediments or encountering serpentinized forearc mantle.

3. *Why does the fault strength appear to be very low?*

There are clear indications of very low shear stress on subduction thrust faults and no thermal anomaly has been detected over the seismogenic zone as would be expected with significant shear heating. These characteristics are similar to those of the San Andreas fault. The subduction thrust faults are thus inferred to be very weak relative to Coloumb friction behaviour, in spite of generating great earthquakes.

4. *What is the nature of "asperities"?*

Asperities are areas of subduction thrust faults that have experienced large slip in great earthquakes. Adjacent areas that had smaller slip in a great earthquake may have some motion in non-seismic creep. Asperities are often inferred to be stronger than adjacent areas, but it has been difficult to establish what physical characteristics would make them stronger. It also is not certain that these areas of greater slip in one earthquake always have greater earthquake slip.

5. *What causes tsunami earthquakes?*

There appears to be large variations in the rate of slip in subduction thrust slip events, i.e., fast slip rates that generate strong earthquake waves, moderate slip rates that can generate large tsunamis, and slow slip that is detected only geodetically. Especially important is the nature of "tsunami earthquakes". Why do some large slip events have most stress release in the seismic motion of great earthquakes, whereas others have slower slip that generates only moderate earthquakes but large tsunamis?

6. *What controls the decollement depth on subduction thrust faults, and how is the décollement depth connected to seismogenesis?*

The subduction thrust fault vertical location varies from directly at the top of the oceanic crust to over 1000 m higher within thick incoming sediment sections. In some areas the decollement depth changes with time and with landward distance, such as the step down from within the incoming sediment section to near the top of the oceanic crust observed in areas of the Nankai margin. Composition variations such as clay rich layers, pore pressure, consolidation, and mineralogy phase changes have been suggested as controls.

C. THE OD21 RISER DRILL SHIP CAPABILITIES

A scientific riser drill ship is planned to be constructed and operated by Japan with the scientific program and operating costs to be shared internationally. Industry needs for deep water drilling technologies are helping to drive the project. The ship sea trials are planned for 2003 and initial drilling at the end of 2004 or in 2005. The capabilities were discussed by the DPG with OD21 engineers in some detail. A short summary is given here. Numerous technical challenges are being addressed. For example, a coring bit is being designed in collaboration with ODP to withstand temperatures up to 250 C. The coring facilities are to be the mainly the same as for the present JOIDES Resolution, and include a pressurized core recovery system. The proposed targets include coring for biological studies and drilling into the mantle, as well as subduction zone targets. Shorter pilot holes are expected at each deep drilling site to evaluate the formation and drilling conditions. The time to drill the maximum 7 km below the seafloor is very approximately 3 years. Holes of 3-5 km should take less than a year and it may be possible to achieve prime initial objectives with these depths.

OD21 Water Depth and Penetration Capability

The planned riser drill ship has an initial capability of 2,500 m water depth (i.e., riser length), to be extended in later phases, and a 10,000 m drill string. The drill string length is not a serious limitation since a 7,500 m hole would require very long drilling times and difficult drilling conditions, so may be avoided in initial phases of OD21 if the main objectives can be achieved with less drill penetration. However, the 2,500 m water depth limit does severely limit the possible sites

for seismogenic zone drilling. For most subduction zones, this water depth is on the middle continental slope where the sub-bottom depth to the subduction thrust is over 5 km and temperatures are quite high. Areas must be sought where the drill penetration required is a minimum. Accurate estimates of the depth to the decollement (seismogenic zone) are needed prior to drilling, mainly from detailed multichannel seismic reflection data.

Hazards for drilling

The main expected subduction zone deep drilling hazards are, (a) unconsolidated sediments, faulting and associated geological problems, (b) formation overpressure, (c) high downhole temperatures, (d) severe weather, especially typhoons and hurricanes, (e) strong ocean currents, such as the Kuroshiro ocean current off S.W. Japan, (f) gas hydrates and gas/water flow.

Borehole instability due to faulting and unstable sediments, and formation overpressure due to water, hydrocarbons, and gas hydrates should be much less of a problem for the OD21 drill ship than for the JOIDES Resolution. OD21 will be able to circulate heavy drilling mud, balancing the formation overpressures and conditioning the borehole wall for improved hole stability. However, in order to balance the expected high formation pressure in the deep portions of the hole with heavy mud and not fracture the upper formation, it will be necessary to case at least the upper portions of the holes. It may be necessary to case most of the hole. The riser system also allows the critical well control (blowout prevention) needed to drill where there is the potential for hydrocarbons.

High downhole temperatures are a feature of most sites where the subduction thrust is at a depth within the drilling limit (i.e., subducting young crust, see below). For a region subducting young oceanic crust such as Nankai Trough, the formation temperatures at a 5 km subbottom decollement are about 150C +/-50C. The hole may be cooled by drilling circulation which reduces the temperature problem for drill bits and downhole assemblies. However, with cold drilling fluid there is the potential to thermally fracture the formation. The hole also may be cool enough to operate logging tools having a moderate temperature limit, if cooling circulation is for a long period and measurements are done quickly before significant thermal recovery. A much more serious temperature limitation is for long-term downhole recording. It may be necessary to limit recording electronics to near the top of the hole, with connection to high temperature-limit sensors located at

greater depth. Detailed heat flow probe measurements and thermal proxy data such as BSR depth, detailed thermal modelling, and pilot hole temperatures are essential to accurately predict the temperature of the formation to be drilled.

Typhoons and hurricanes (defined by wind speeds greater than 17.2 m/s) are a serious hazard for long duration drilling in the Pacific and Atlantic. There are 4-5 per year at off SW Japan in summer to autumn. They have diameter 100-2000 km. The maximum recorded wind speed was 70 m/s (in 1979). Drilling off SW Japan is not recommended in July-October although routines for temporarily abandoning the hole will be developed. Coping with typhoons requires: clear and firm criteria for determining when to evacuate; enough warning for orderly evacuation (condition and plug hole, retrieve downhole pipe and equipment, and prepare ship); initial estimates are that the minimum lost time would be 1 week.

Strong ocean currents are a hazard in several areas, including off SW Japan Nankai Trough. The Kuroshiro current can reach speeds of up to 3-5 knots (1.5-2.6 m/s) and covers much of the 2,500 m water depth sites in this area. The OD21 riser drill ship initial design is to operate in maximum current 1.5 kts and wind speed 30 m/s, and current of 2.5 kts at wind speed 23 m/s, so there may be times that the ship cannot operate continuously at the centre of the Kuroshiro current. The riser, rather than station keeping is the limiting factor. Excessive side force could cause damage or loss of the riser. Further studies are in progress to deal with strong currents.

D. SELECTION OF SEISMOGENIC ZONE DRILL SITES

The choice of sites for SEIZE drilling involves, (a) suitability of sites for achieving the scientific objectives, (b) physical capabilities of the OD21 drill ship, (c) practical drill hole depths and drilling durations, (d) availability of detailed site surveys and other information needed for drilling, and needed to complement the borehole scientific results. The DPG mainly examined sites in the Japan area, but the analyses are applicable to sites elsewhere around the world.

Scientific Requirements for Site Selection

The DPG did not review in detail the available site survey and previous studies for the Japan region or other possible sites globally. However, some of the important site needs are listed here:

1. A subduction zone where the tectonics, structure, thermal regime, and earthquakes are very well studied and well known (see site characterization requirements below). Previous shallow drilling of the subduction thrust and on the continental slope in the area of the proposed deep site would be essential. The regions should be structurally simple with an inferred decollement that is fairly stable in position and depth with time.

2. Shallow plate dip and shallow trench such that the subduction thrust fault can be reached by OD21 drilling in a reasonable time, i.e., less than 5 km penetration. This appears to require sites where young oceanic plates are being subducted. It is recognized that young plates also usually means high thrust temperatures. In addition to the greater drilling time and greater potential for failure, deeper subduction thrusts can be less well characterized because of the decreased resolution of seismic and other signals with depth.

3. Accretionary prism sediments or other formation that it is expected to be readily penetrated by the OD21 drilling. A low temperature gradient (heat flow) is desirable, although it is recognized that shallow drilling penetration generally is associated with young hot plates.

4. The subduction thrust should be accessible to non-riser drilling seaward from the main deep riser site that penetrates the seismogenic zone. The 2,500 m water depth limit does not apply to non-riser drilling, but the practical maximum penetration for non-riser drilling is probably less than 2 km. At Nankai Trough (Site 808) penetration of 1,300 m through the décollement into basement was achieved. However, there have been considerable drilling difficulties previously by ODP for penetrations in accretionary prisms much greater than about 1 km.

Non-riser drilling of an out-of-sequence thrust fault, connected to the décollement and well imaged with defined reflection polarity, is very desirable.

5. A recent great earthquake within the seismogenic zone that has been well studied is needed to characterize the seismogenic zone. A map of slip displacement in the event is desirable. Shorter earthquake return times should mean a shorter time scale for the changes associated with the great earthquake cycle.

6. The subduction thrust should be well imaged by multichannel seismic data, especially in the area of the seismogenic zone to be drilled. It is critical to know the depth of the decollement, and its thickness and reflection polarity. Also the better the image of the surface of the seismogenic zone the more readily can the drilling data results and conclusions be extended laterally and to other regions.

7. The locked part of the seismogenic zone should be defined. This may be achieved by, (a) the updip and downdip limits of rupture of great earthquakes (seismic modelling, aftershock distribution, tsunami modelling), (b) the distribution of intermediate size and small earthquakes (especially with thrust mechanisms) that define which part of the thrust is seismic, (c) geodetic data (interseismic and coseismic), both on land and if possible on the seafloor, that define the locked zone. In some areas peninsulas allow land geodetic measurements sufficiently far seaward to define the seaward as well as landward limit of the locked zone.

Drill Site Water Depth, and Penetration to Seismogenic Zone

As noted above, the maximum water depth for the first phase of OD21 drilling is 2,500 m; this is an important technical limitation. Initial study indicates that around Japan, only at a few sites with sufficiently shallow water can the seismogenic zone be reached with reasonable drill penetration. Subduction zone water depths are mainly controlled by the age of the subducting oceanic lithosphere. This is seen by the great depth of the Japan Trench which subducts old oceanic crust compared to the much shallower Nankai Trough which subducts approximately 15 Ma oceanic crust. Cascadia which subducts 5-8 Ma crust has an even shallower water depth. To a first order, thermal expansion in young high temperature lithosphere reduces the density, and isostasy results in shallow seafloor depths. Unfortunately, young lithosphere (and shallow depths) is also usually associated with high heat flow and high temperatures. Costa Rica is an atypical exception; the subducting crust is young but the heat flow is low probably because of hydrothermal heat loss from the underthrusting crust. High formation temperatures are an important drilling and measurement problem, and are especially serious for long-term recording instrumentation. Local variations in the topography of the subducting oceanic crust also are important to the required drilling depth. Areas of subducting aseismic ridges (thickened oceanic crust) or of subducting seamounts may significantly

shallow the seismogenic zone, although these areas are geologically atypical. There may be a trade-off between much shallower drilling penetration and the desire to drill "typical" seismogenic zones. Although more study and survey is needed, it appears that the most feasible sites in the Japan area for initial seismogenic zone drilling are off SW Japan (Nankai Trough).

The SEIZE DPG did not examine potential drill sites in the Nankai Trough in detail. However, initial examination suggests the following limitations of water depth and penetration required to the subduction thrust fault,

Central-Western Nankai Trough is the area with the shallowest dip of the subduction thrust and thus the area where the seismogenic zone probably can be reached with the least penetration hole. Most of the Eastern Nankai Trough has a steeper thrust dip and thus the subduction thrust is at too great a depth. However, one area in the easternmost Nankai Trough may be reached at a shallower depth. This area needs further high quality multichannel seismic reflection to confirm the depth to the subduction thrust fault. The area is structurally complex but may have less influence from the Kuroshiro current that is an important drilling hazard for Nankai Trough.

The Central-Western Nankai Trough area of ODP Site 808, Leg 131, is in an embayment in the continental slope. As a consequence, where the water depth is 2,500 m in this immediate area, the depth to the subduction thrust is near the limit of the OD21 drilling capability. However, in an adjacent area just to the southwest the thrust is shallower due to the top of the oceanic crust rising over a seamount or aseismic ridge. This latter area has an atypical crustal and thrust structure so is not ideal, but the subduction thrust may be reached at only 3-5 km so the site warrants serious consideration.

For most drill sites with water depth less than 2,500 m, the borehole should penetrate the seismogenic portion of the subduction thrust. Such sites should be landward of the aseismic updip portion of the thrust; for the Nankai Trough the aseismic zone extends very approximately 30 km landward of the trench.

Site characterization requirements; site surveys and studies

Extensive site surveys and studies are needed prior to drilling, (a) for drilling information such as the drilling depth, formation type and conditions etc., and (b) for scientific integration with

the results of the drilling and downhole measurement and for extrapolation of the borehole data regionally.

1. *Seismic structure:*

The seismic structure must be well imaged in 3 dimensions (e.g., 3-D multichannel, OBS, seismic refraction, earthquake determined structure). Excellent seismic reflection images and accurate velocity information are needed to; (a) determine the drilling depths to the decollement, (b) to provide information on the sediment type and state that will be penetrated, (c) determine the structure of the decollement, e.g., the thickness and reflection impedance structure (note the regional variation in reflection polarity found in a 3-D seismic survey of the Barbados subduction zone), (d) determine the regional structure to allow extrapolation of the borehole results to regional patterns. Such surveys need to be well in advance of the drilling (about years 2000-02 for initial OD21 SEIZE drilling).

2. *Earthquakes:*

Great subduction thrust earthquakes in the area must be studied exhaustively, especially to provide information on the updip and downdip limits of rupture, and the spatial distribution of slip on the thrust. Smaller thrust events also may provide limits to the seismogenic zone. Events not on the thrust (Wadati-Benioff and in overlying crust) provide information on the state of stress in the subduction oceanic plate and in the overlying crust. The regional seismicity provides information on the tectonic regime. Recording with ocean bottom seismographs and seafloor cables are very desirable.

3. *Tsunamis:*

Tsunamis along with earthquake shaking are a very important hazard of great earthquakes. Tsunamis that have occurred in the area of the planned OD21 drilling should be carefully studied and modelled. Modelling of the observed wave heights and waveforms at regional tide gauge stations allows quantitative estimates of the seaward limit of the fault rupture, i.e., the seaward updip limit of the seismogenic zone. Analysis of tide gauge data also may constrain any major seafloor failures or slumping, especially associated with great earthquakes. The deformation regime at the toe of the accretionary sedimentary prism, and any inferred seafloor failures should be correlated with data from seafloor mapping.

4. *Thermal data and deep temperatures:*

Heat flow data and deep temperatures estimated from thermal models are essential for, (a) the conditions in the borehole for drilling, measurement and recording, (b) temperatures on the subduction thrust for interpreting thermal controls on the limits to the seismogenic zone, (c) to constrain regional tectonic models. Heat flow data comes from heat probe measurements, heat flow estimated from gas hydrate BSR depths, and from measurements in pilot drill holes. High quality (including insitu thermal conductivity) very detailed multipenetration heat probe surveys are needed in a profile across the margin in the area of the drill sites, as well as regional 2-D coverage. The seismic reflection surveys (see above) allow regional mapping of the heat flow through the depth to the gas hydrate BSR where it is present. Strong advective fluid flow heat transport such as up fault zones, will locally change the BSR depth. Thermal models used to extrapolate temperatures to depth require, (a) the thermal properties of the sediments with depth, especially thermal conductivity, (b) the radioactive heat generation (and other heat generation) with depth, and (c) estimates of any fluid flow advective heat transfer.

5. *Tectonic regime:*

The overall present tectonic regime and tectonic history must be well understood, including plate convergence rate and direction, incoming plate thermal regime, age of the incoming oceanic plate, incoming sediment section and history. These characteristics provide the input to the subduction system. Details of faulting and deformation in the accretionary sedimentary prism are also important. For example, fluids coming from thrusts that reach the surface ("out-of-sequence thrusts") may tap the seismogenic zone.

6. *Regional geophysics: magnetics, gravity etc.:*

Detailed mapping of the structure of the incoming oceanic crust is needed. Magnetic and gravity data are important for interpretation of the age and structure of the incoming oceanic plate, and for the regional tectonic regime of the subduction zone.

7. *Seafloor geology:*

Much information on deeper structure and processes can be inferred from mapping and measurements on the seafloor. The data should include seafloor bathymetry, morphology, composition, lithology, surface faulting, fluid vents, and evidence for seafloor slumps and other

geological hazards. High resolution swath bathymetry and swath imagery (backscatter) can define structures such as faults that reach to or near to the seafloor, erosion and slope failure processes, and seafloor venting. Coring and dredge samples should be obtained over systematic profiles and grids. Core pore fluid chemistry provides important information on upward fluid and chemical transport; thrust faults may channel fluids up from the depth of the seismogenic zone to the surface. Pore fluid chemistry also can provide information on the approximate temperature at the fluid source. Piston coring also provides near-surface samples at the drill site; drilling usually does not sample the near-surface sediments well. Manned and unmanned (ROV) submersible studies of specific structures including areas of fluid expulsion, especially in the immediate area of proposed drill sites should provide important information.

8. *Geodesy (land and seafloor)*

Geodetic data provide important constraints on the great earthquake cycle. Such data and interpretative dislocation and other fault deformation models constrain the part of the subduction thrust fault that is locked at present and that is seismogenic. Modelling of the abrupt surface deformation (horizontal and vertical) at the time of great earthquakes constrains the rupture area. The pattern of slow, steady deformation in the interseismic period between great events, also constrains the part of the fault that is locked at present and may rupture in future great earthquakes. The most important geodetic data comes from GPS horizontal measurements, both from continuously operating sites, and from campaigns of re-measurement of geodetic benchmarks at intervals of a few years. Horizontal data also comes from repeated laser ranging between geodetic benchmarks. So far, GPS data determines vertical deformation less well, and interseismic vertical motions are best constrained by repeated precision levelling lines, repeated precision gravity measurements (especially high precision absolute gravimeters), and long-term tide gauge records. On most subduction zone margins, land GPS and other geodetic data can provide good constraint to the landward limit of the locked seismogenic zone, but provide little information on the seaward limit. Constraint for the seaward limit of the locked zone requires seafloor measurements. Initial measurements across the N. Cascadia subduction margin and trials off Japan have demonstrated that adequate accuracy is possible using precision acoustics to range from seafloor benchmarks to the sea surface, and GPS from the sea surface to land GPS sites. Such measurements would be very

valuable for margins to be drilled by OD21.

9. *Exhumed ancient subduction zones*

An important source of information on the deep structure and composition of subduction zones comes from eroded ancient subduction zones. Although some ephemeral characteristics such as pore fluid chemistry may be lost with the change from original insitu conditions, the main changes in sediment composition and structure should be preserved. Exhumed fluid inclusions in ancient veining may constrain previous fluid and previous pore pressure regimes. In some areas it may be possible to identify and study previously seismogenic parts of ancient subduction thrust faults.

The Nankai Trough

The Nankai Trough is one of the best studied and characterized subduction accretionary prisms in the world and thus meets most of the the requirements well (see below). Although more survey and study are needed, the area is well known and the most important measurements and studies have been made, i.e., multichannel seismic reflection and OBS seismic structure information, detailed earthquake studies, detailed heat flow probe measurements and heat flow estimates from the depth to gas hydrate BSRs. It has had numerous detailed regional seafloor geological and geophysical surveys and studies. It also has had a series of previous DSDP/ODP drilling legs, and two proposed new drilling legs.

E. MEASUREMENTS ON CORE, CUTTINGS AND FLUIDS

Core and cuttings studies in a transect of holes across the updip limit of the seismogenic zone are required to determine the changes of subducted materials in response to progressive downdip changes in the environment of the thrust. The changes include the physical, chemical, and structural properties of the sediment matrix and of the pore fluids. Most of the required core measurements are now being done on samples recovered by JOIDES Resolution, but some additional measurements and analyses are needed for SEIZE objectives. Also, a sampling and measurement program must be set up for the cuttings recovered from the return drilling fluid circulation.

Important questions include: (a) What is the input sediment at the level of the decollement?

(b) How do the physical and chemical changes relate to changes in the environment; temperature, pressure, stress, hydrological regime etc.? (c) What are the relationships between episodic faulting, fluid flow and chemical changes at different depths along the subduction thrust fault? (d) What are the along strike changes in composition, physical and chemical state, and in environment, and how do they relate to the seismic behaviour?

Some of the important core and cuttings measurements with depth and landward are (with special attention to the decollement):

1. Detailed sediment lithology, with depth and landward
2. Sediment type and matrix composition (and underlying basement composition),
3. Sediment chemical and physical changes with depth and landward; compaction, diagenesis, alteration, pressure solution, mineralogy changes etc.
4. Sediment physical properties; sonic, elastic, index, thermal, electrical, magnetic, etc.,
5. Sediment pore fluid chemical composition and isotopic regime;
6. Sediment and pore fluid inorganic and organic chemistry, including gas hydrate recovered in a pressurized sampler,
7. Pore fluid gases in core and cuttings, and in return fluid circulation,
8. Structural fabric, faulting, fracturing, cataclasis, strain localization, and relations to fluid flow,
9. Geophysical fabrics; magnetic fabric, anisotropy, X-ray goneometry, etc.
10. Mechanical and geotechnical deformation properties; dilatency, frictional characteristics
11. Hydrogeological properties, especially permeability, and dependence on pore pressure etc.,
12. Dependence of many of the above parameters on insitu temperature, pressure, stress etc., as determined in the laboratory.

It is noted that the drilling mud selection and monitoring must consider chemical and physical contamination of the cuttings and core samples, especially the pore fluids.

F. DOWNHOLE MEASUREMENT AND RECORDING

Downhole measurements

A full suite of downhole measurements is critical to the scientific success of the SEIZE

project. These must be acquired using a combination of wireline logging, logging while drilling (LWD) and packer pore pressure and permeability tests in cemented and perforated casing, and in the open hole. The types of data needed are listed below, grouped into items that are essential to the scientific success of the project and those that would be useful but that are not as critical.

In this list, asterisks (*) denote measurements for which significant instrument technology development is required for use at very high temperatures (greater than about 250C). If high-temperature tools are known to exist, the temperature limitations of these tools and the known sources for these tools are given in parentheses. Downhole geophysical tools are being developed rapidly, and it is recommended that a review of the current status of high-temperature and other tool development in industry, government and university laboratories be carried out, to ensure that this list is current and to identify which new high-temperature tool development is warranted. It is noted that development of high-temperature tools is expensive. If possible, high temperature formations should be measured using rapid circulation cooling followed by short measurement durations such as to allow conventional logging and other measurement tools to operate.

1. *Wireline logs*

(temperature limit of present tools in brackets)

Essential Logs

-*Formation Micro Imager (FMI or FMS)

-Borehole Televiewer (250C)

-Density (260C)

-Natural Gamma (260C)

-*Porosity (200C)

-*Dipole Sonic log (directional Vp, Vs and full waveform)

conventional acoustic log (232C)

-*Resistivity (high-T)

-*Geochemical Logging

-Vertical Seismic Profiling (VSP) (250C)

-*Cement Bond Log (200C)

-Temperature (continuous 260C; memory 400C)

-Temperature, bottom-hole penetrating probes (100C for shallow sediments)

Some Additional Logs

-Magnetic Field (300C)

-*Magnetic Susceptibility

-*Nuclear Magnetic Resonance

-*Cross-hole seismics, resisitivty, and hydrologic testing

-*Sidewall Coring

-*Gyroscopic Directional Survey (repeat logging for casing shear)

-*Ultrasonic Cement Imager (" " " ")

-Borehole Gravimeter, for formation densities (250C)

2. *Logging-while-drilling*

Logging-while-drilling (LWD) is especially important for SEIZE drilling because of the need to measure transient properties immediately after drill penetration. Moreover, it will be necessary to case much the hole, limiting conventional logging to short segments prior to installation of each casing string. LWD is being rapidly developed and the tools available are increasing and improving. The state of tool development and availability should be reviewed just prior to the SEIZE drilling. The tools should include at least the following:

-*Resistivity (150C)

-*Density Neutron (150C)

-*Sonic (150C)

-Natural gamma (150C)

-*Drilling Parameters/MWD (175C)

There may be substantial borehole cooling during drilling so tools may be used where the equilibrium formation is higher than the tool rating. However, tools may overheat if they become stuck in the hole.

<u>Fluid sampling, permeability, pore pressure and stress</u>

A number of tools and packer systems are available to determine the formation pore pressure, formation permeability, and to sample formation fluids. These include:

-Packers set at base of casing after each casing string installed, and over perforations in cemented casing (250C); for permeability, fluid pressure and stress

-Borehole Fluid Samplers (250C); for fluid sampling in conjunction with above packers if formation permeability is high

-*Modular Dynamics Tester (175C); for fluid sampling and permeability through casing perforations if formation permeability is low.

-Borehole flow and inferred permeability where flow rates are high: Temperature/Pressure/Spinner Flowmeter tools (250C); give vertical distribution of permeability if borehole flow rates are high.

-*Inflatable Packers deployed through the drill-pipe also may be used in the open-hole (150C)

Technology development (see * items above)

Seismogenic zone drilling, measurement and monitoring will bring special challenges in drilling, sampling and instrumentation. (a) A hole must be drilled to depths of up to 7 km in unstable and poorly indurated materials, where bottom-hole temperatures are expected to reach up to 250C. (b) Substantial amounts of core are needed in at least some intervals, either in the main hole or in inclined holes branched off the vertical borehole to cross the fault at multiple positions. (c) It should be possible to re-enter side branch drillholes for implanting or replacing borehole monitoring devices. (d) Sophisticated borehole geophysical logging operations, in-situ measurements and fluid/rock sampling at high temperatures are required. There is a strong likelihood that the drilling and sample recovery conditions within the fault will be extremely difficult, owing to high fluid pressures and poorly indurated gouge materials within the fault zone. (e) Some or all of these holes must be instrumented for continuous monitoring of seismicity, deformation, fluid pressure and a broad range of physical and chemical properties over long periods of time.

Areas in which technological research and development will be required for the SEIZE project, some of which are identified by asterisks (*) above include:

-Multiple whipstock and reentry from a single hole (especially for cross-hole surveys and hydrologic testing),

-Logging while drilling (LWD) at high temperatures

-High temperature geophysical logging tools, seismometers and packer systems,

-Long-term downhole monitoring (sensor design, cables, data telemetry, power sources, installation and repair procedures)

-Casing and completion at high temperatures and in poorly indurated/unstable materials.

G. LONG-TERM MONITORING (CORKS)

Downhole monitoring and recording

Borehole CORK-type downhole measurements and observatory systems are a critical part of the scientific program for SEIZE. These systems allow monitoring insitu pore pressure, temperature, and deformation during the earthquake cycle and provide reliable measures of undisturbed formation temperatures, especially if packers prevent fluid circulation in the borehole. In conjunction with these measurements, seismic monitoring would provide invaluable information about the source processes of nearby microearthquakes. Monitoring of fluid chemistry, borehole flow and time varying electric and magnetic fields (e.g., streaming potential), together with periodic fluid sampling would provide insights into time-varying geochemical and hydrologic processes within the subduction zone, and changes with time of physical properties of the seismogenic zone.

The parameters that should be monitored in borehole CORK installations include:

1. *Essential Measurements and Sampling*

-*Strain/tilt

-Seismometry for earthquakes and controlled sources (250C);

-Temperature-depth

-*Fluid pressure at multiple horizons

-*In situ fluid chemistry

2. *Other Measurements and Sampling*

-*Fluid sampling with tracers/tags

-*Electromagnetic fields

-*Fluid conductivity

-*Flowrate (especially electromagnetic sensors)

Seafloor recording and monitoring

Borehole downhole monitoring should be augmented by a sea floor observatory (i.e., similar to the Italian GEOSTAR system) including ocean bottom seismometers as a minimum. Important parameters to be recorded include seismic data (with geophones and hydrophones) and sea floor deformation (geodetics).

H. MANAGEMENT OF SEIZE DRILLING AND MEASUREMENT PROGRAMS

The planning and scientific operations for longer duration OD21 programs will be very different from past ODP/DSDP experience based upon 2-month drilling legs. In ODP/DSDP the science objectives and science plan were distinct for each drilling leg, with the primary objectives defined by the proponents of successful drilling proposals. For OD21, much longer term planning is required and the objectives may be much broader. The SEIZE DPG recommends that an expert scientific team be set up for each major SEIZE program to develop detailed scientific and operational plans. The San Andreas Fault drilling proposal provides one model for such a team. The team is expected to develop detailed plans and to carry these plans through to the scientific program onboard the ship during drilling. The team should have subcommittees for each of the main scientific programs involved in the SEIZE drilling, including the required site surveys and associated scientific studies. The scientific team must work closely with the JAMSTEC drilling engineering and science groups who are responsible for design, construction and operation of the OD21 drill ship. An outline of the suggested scientific team needed for a SEIZE drilling and measurement program is given below.

SEIZE Management Team

The SEIZE management team may be made up of 4-5 subcommittees representing the different scientific components. For each subcommittee, 6 to 8 members are suggested (see below). For the subcommittees, it may be appropriate to have an initial competition for the best and most motivated participants based upon scientific and technical proposals. Previously received letters-of-intent for the SEIZE DPG should provide a partial list for soliciting proposals. These discipline

subcommittees then would prepare detailed science plans for their part of the program. A small oversight committee with representation from all of the subcommittees (i.e., chairmen of subcommittees) would provide overall scientific management of the SEIZE drilling project. For the initial phase of the SEIZE program it may be desirable to have one Japanese and one International co-chairman for each subcommittee.

A suggested SEIZE drilling subcommittee list and some of the scientific expertise needed to be represented are:

1. *Site Characterization*

-seismic structure (multichannel, refraction, OBS, earthquake determined structure

-earthquakes (great and micro earthquakes; tectonics)

-potential fields, magnetics, gravity etc.

-thermal (heat flow probe data; BSR heat flow; heat generation;
thermal properties; thermal modelling)

-seafloor (morphology, faults, fluid vents, coring and dredging)

-geodesy (land and seafloor)

-predictions of lithologic and structural character from ancient analogues

2. *Downhole Measurements*

-downhole logging

-accretionary prism hydrogeology (temperature, fluid sampling, packers etc.)

-seismic structure data; inhole experiments

-stress and strain measurements

3. *Sampling and Measurements on Core, Cuttings and Fluids*

-sedimentology; paleontology

-small scale structural geology

-formation fluid chemistry, inorganic and organic

-gas hydrate

-physical properties (velocity, electrical resistivity, density, porosity etc., geotechnical)

-magnetics

-biology

4. *Fault Zone and Sedimentary Prism Monitoring*

-pore fluid pressure, chemistry, temperature, CORK

-downhole recording of earthquakes

-stress and strain monitoring; tectonics, engineering geophysics

-electrical transients, velocity transients

(Note the need for high temperature instrumentation for long-term recording)

Data management

Careful and thorough data management and dissemination is essential to the success of the SEIZE drilling project. A data management subcommittee thus may be needed, although this function may be integrated into the overall OD21 data management.

SEIZE funding

Every effort should be made for the critical components of the project to be funded together, including the most important site surveys and studies. Independent funding should be only for site surveys, associated science, and parts of the program that are not essential to the overall success of the project.

Interim Report of the Architecture of the Oceanic Lithosphere (AOL) Program Planning Group

The architecture of oceanic crust at fast and slow spreading rates reflects contrasting modes of chemical, thermal, and physical interaction of materials from the mantle with those of the hydrosphere, atmosphere, and biosphere. Drilling provides a key role in understanding the architecture of ocean lithosphere and crust, as it is the only means available to achieve full answers to a variety of scientific questions related to four key sets of processes

- Mantle Dynamics and Melt Extraction
- Magmatic Accretion of the Crust at Fast and Slow Spreading Rates
- Lithospheric extension
- Fluid Circulation

Fundamental advances in these four process-oriented themes are required to achieve the overall goals of the program we propose for investigating the Architecture of Oceanic Lithosphere. These four themes comprise the cornerstones of our program, and define a scientific context for the individual drilling proposals needed to achieve our objectives.

Mantle Dynamics and Melt Extraction: Creation of the ocean lithosphere involves the upwelling and melting of mantle material, and the migration of melt toward the axes of mid-ocean ridges to form the crust. At the same time, the residue of mantle melting flows laterally away from the axis and becomes incorporated into the thickening ocean lithosphere. In order to investigate these fundamental processes, it is necessary to drill into and recover portions of the oceanic upper mantle and lower crust that preserve a record of these deep processes in their mineralogy, texture, and larger scale structure. Upper mantle peridotites preserve a variety of solid and melt flow indicators, allowing ridge-related mantle and melt flow fields to be directly mapped, given adequate recovery from a network of drill holes. What are the directions and patterns of mantle flow at the segment level, and to what extent do these control segmentation patterns? How is melt extracted from this flowing mantle, and what are the forces that drive this melt flow? To what extent do diapiric structures mapped in ophiolites reflect the size and scale of mantle flow and how are the flow patterns influenced by spreading rate?

There are strong indications from theoretical and experimental work that answers to the above fundamental questions will depend critically on the spreading rate. Patterns of mantle and melt flow are expected to be more focused below slow-spreading ridges and secondary flow patterns may be more apt to develop. For this reason, it is necessary to investigate drilled peridotites from both slow and fast spreading ridges to investigate the full range of behavior. This is one reason we feel that additional drilling at Hess Deep (successors to 551-Pre) is extremely important.- it represents the only viable drilling target for fast-spreading lithosphere in the pre-2003 timeframe. It is also why we advocate peridotite drilling at a variety of possible sites at the Mid-Atlantic Ridge and other slow-spreading ridges such as SWIR, including a return to site 735 (535-Full), peridotite drilling at the 15°20'N MAR site, and drilling into peridotites at windows provided by low angle detachment surfaces at the Kane FZ (532-Pre), and the Atlantis FZ (proposal 512).

Magmatic Accretion of the Crust at Fast and Slow Spreading Rates: Conductive and advective cooling of mantle-derived melt intruded at shallow levels is directly responsible for creating the layered oceanic crust. To what extent the deeper gabbroic crust is formed solely by cooling of shallow magma lenses in the upper crust (gabbro glacier model), or, as suggested by studies of the Oman ophiolite, also by melt intrusions near the base of the crust, is an important fundamental question that can only be answered by drilling gabbroic rocks from ocean crust produced at a variety of spreading rates. For this reason we strongly urge the sampling of intact sections of

gabbro from fast (Hess Deep, again), and slow spreading centers (735B, 15°20'MAR, the Atlantis and Kane detachment surfaces). To what extent is lateral melt migration responsible for differences in crustal thickness detected at slow spreading segments with gravity "bull's eye" patterns? This basic question can also be answered by drilling of carefully selected gabbro sections in slow spread crust.

Equally important is understanding the dynamics and behavior of shallow magma lenses and the extent to which their behavior regulates intrusion of dikes and eruptive activity. This is reflected by the compositional architecture and stratigraphic variation of volcanic rocks that build the uppermost layer of the crust. It is of fundamental importance to determine whether the seismic layer 2A corresponds to extrusive lavas because if so, then seismic imaging can be used to map this layer throughout the oceans. Drilling is the only way to make this determination for normal in situ ocean crust, and is a prime objective of drilling at the Guatemala Basin site (522-Full) and at zero-age crust at the East pacific Rise (proposal in preparation).

Lithospheric Extension: It is well-known that crustal accretion involves both magmatic and tectonic processes, but the interaction between the two is still poorly understood. New and very exciting studies at a variety of spreading rates indicate that in some cases, extension of the lithosphere may occur in the virtual absence of magmatic activity along low angle detachment surfaces commonly found near the inside corners of transform faults. These appear to represent the on-land structural equivalents of metamorphic core complexes that form also in extensional settings like the Cordillera. The manner in which these oceanic features form and develop is of fundamental importance to understanding the thermo mechanical response of ocean lithosphere and to basic tectonic issues of what controls the fracture mechanics of crustal rocks. Drilling is required to test between competing models of the dynamics of oceanic low angle detachment faults,. As an added bonus, these detachment surfaces also provide tectonic windows to the lower crust, providing thick and intact sections of oceanic gabbro and peridotite, such as at site 735. Drilling into detachments at the slow-spreading MAR (532-Pre and 512) is crucial for determining how and why detachments form and to what extent low angle faults serve as flow channels for hydrothermal fluids.

Fluid Circulation: Hydrothermal circulation in the ocean crust is the dominant mode of lithosphere cooling and plays a major role in global biogeochemical cycles of material and energy. Drilling provides the only means of investigating the deeper portions of active systems along the mid-ocean ridge system and on their flanks. It is of fundamental importance to determine the extent to which hydrothermal fluids advectively cool the lower crust and possibly even to some extent, the upper mantle. How do individual systems evolve and mature, and what are the physical and chemical processes that occur in the deep reaction zones? Firm answers to these questions require drilling into active systems at a range of spreading rates and tectonic settings, as there appear to major differences in the longevity, size, and metallogenetic processes occurring at fast (East Pacific Rise) and slow (e.g. Mid-Atlantic Ridge) systems, and among systems at mid-ocean ridges vs. back arc basins. Successful drilling of this type will require technological developments such as advances in bare-rock drilling, high temperature logging, and fluid sampling.

Our proposed program will make important strides before 2003 with the existing platform, and in many cases, without new technology. Prior to 2003, we advocate starting a deep reentry hole in fast or superfast spread crust, with continuation to Moho with a multileg program after 2003. At the same time, and with existing technology, we propose direct sampling of the plutonic foundations of the oceanic crust at both fast and slow spreading rates. Conceivably, drilling into low angle detachment surfaces can simultaneously provide breakthroughs in understanding of mantle dynamics and melt migration, magmatic accretion of the crust, and lithosphere extension. This drilling does not require new technology and since many potential drill sites are in relatively shallow water (<2500m) this drilling can be continued with a short

riser beyond 2003. This is also the case for zero-age drilling at the East Pacific Rise, although such drilling will probably require good active heave compensation, and possibly new casing and bit technology. A longer riser (~4000m) or alternative methods of well control for drilling in deep water will be needed in the post-2003 program to complete drilling through an intact section of fast spread ocean crust, drilling the deep reaction zones of active hydrothermal systems, and penetrating low angle detachment faults to the depth of the decollement.

OCEAN DRILLING RELATED TO TECTONICS AND CLIMATE

A Plan for pre- and post-2003 Drilling

Prepared by: Tectonics and Climate Program Planning Group

Executive Summary One of the aims of ocean drilling is to obtain a record of past climate fluctuations and understand the mechanisms responsible for such changes. A number of studies indicate that changes in solid earth boundary conditions (e.g., orography, continental positions, ridge volume, ocean gateways) alter ocean and atmosphere circulation and chemistry, each of which can directly or indirectly affect climate change. The charge of the Tectonics and Climate Panel is to: (i) outline a general strategy for ocean drilling that provides needed information for more refined testing of the role of tectonic changes on climate (and vice-versa) and (ii) solicit drilling proposals to target some of the research needs identified by the panel.

The identified three general research areas as topics for future concentrated effort: (1) effects of tectonics on climate (and vice-versa), either directly on the dynamics of the circulation or indirectly through its effect on weathering and atmospheric carbon dioxide levels; (2) role of ocean gateways in redistribution of heat and their effect on Cretaceous and Cenozoic climate and ocean chemistry; and (3) study of key ridge segments or oceanic plateaus that provide information on the role of these features in modifying sea level. ocean chemistry, and atmospheric CO_2.

The Panel divided recommendations into near-term (pre-2003) and long-term (pre-2003) time frames, with the rationale being that only a limited number of legs will be drilled before the present phase of ocean drilling ends, and that full implementation of a plan could not be accomplished until (and if) a new phase of drilling commences after 2003.

With respect to pre-2003 drilling the Panel recommends: (1) drilling at least one leg in the northern Indian Ocean to constrain better the tectonic evolution of the Himalaya-Tibet region, the history of the south Asian monsoon, and the effect of the former on both the monsoon and global climate; and (2) drilling south of the Greenland-Scotland Ridge to test the hypothesis that changes in depth of the ridge have modulated the production rate of North Atlantic Deep Water. The panel made appropriate gestures of soliciting/supporting drilling proposals in these areas.

With respect to post-2003 drilling the Panel recommends several steps: (1) continued drilling of the northern Indian Ocean and South and East China Seas to build on what is known of the tectonic and climatic history of the region by expanding the sampling of material both spatially and temporally; (2) study of smaller tectonic provinces (e.g., Taiwan, New Zealand, New Guinea, Alaska) where climate changes seem

to have altered styles, rates, and the spatial distribution of tectonic deformation; (3) examination of key ocean gateways (e.g., Indonesia, Drake Passage, Central American isthmus, Tethys Ocean, North-South Atlantic opening, and Arctic gateways) to assess their effect on the world ocean circulation, climate, and sedimentation patterns; and (4) drilling of ridge segments or oceanic plateaus that provide needed information on the role of these features in changing sea level, ocean chemistry, and atmospheric CO_2.

The Panel recommends that highest priorities be given initially to developing: (1) a better understanding of the inter-relations among changing orography, erosion, weathering, and climate change, particularly with respect to the Tibetan/Himalayan complex but also smaller, isolated terrains; and (2) drilling legs that advance our understanding of the role of changes in deep water circulation on global climate, in particular the Drake Passage and Indonesian straits. These topics have been chosen because previous research indicates some of the largest uncertainties are in these areas and that the uncertainties could be narrowed by well-conceived drilling legs.

With respect to implementation of the plan the committee considers several modifications from existing ODP policy/drilling: (1) the use in some areas of coordinated multi-leg drilling to develop a comprehensive assessment of the role of important processes; (2) stronger interactions (at the least through workshops) with the continental tectonics and climate communities to coordinate relevant drilling legs with advances in these disciplines; such workshops might be especially rewarding where there is an opportunity to directly link marine drilling with research on land; and (3) advances in drilling technology to ensure better retrieval of sediments from fan deposits.

A. Brief Scientific Background

One of the aims of the Ocean Drilling Program is to obtain a record of past climate fluctuations and understand the mechanisms responsible for such changes. This information is useful for several reasons:

(1) it provides a time perspective on climate that can be used as a framework for interpreting future projections of climate change;

(2) paleoclimate data can provide constraints on understanding biotic evolution and changes and geochemical cycling;

(3) paleoclimate data can be used to test proposed cause-and-effect relationships among changing physical and chemical processes and boundary conditions imposed by changing topography and climate. Since some of these same processes play important roles in models of greenhouse gas predictions for the future, the geological data allow the importance of such processes to be evaluated under extreme changes in boundary conditions.

B. Charge

The charge of the Tectonics and Climate Panel is to: (i) outline a general strategy for ocean drilling that provides needed information for more refined testing of the role of tectonic changes on climate (and vice-versa) and (ii) solicit drilling proposals to target some of the research needs in this area. The Tectonics and Climate Panel divided their activities into identifying near-term (pre-2003) and long-term (pre-2003) goals, with the rationale being that only a limited number of legs are likely to be drilled before the termination of the present phase of ocean drilling, and that full implementation of a plan could not be implemented until (and if) a new phase of drilling commences after 2003. The Panel views the post-2003 phase element of the plan as contributing to the overall scientific justification for post-2003 drilling.

C. Justifications for Principal Research Areas

Orography, Erosion, Weathering, and Climate Over the last ten years there has been considerable discussion about the effects of changes in orography and its effect on atmospheric circulation and CO_2 levels. Uplift of the Tibetan-Himalayan complex has been a particularly widely discussed topic as to its role with respect to development of the Asian monsoon, late Cenozoic climate change, and atmospheric CO_2 levels. Changes in the American Cordillera and Alpine Complex may also have affected climate, but there are questions as to whether any significant relief changes occurred during the late Cenozoic. Climate change can also affect orography by affecting erosion rates, and through isostatic imbalance, new rates and patterns of erosion can alter the amounts, rates, and spatial extent of tectonic activity in an orogenic belt.

A number of key questions warrant further investigation: (1) Can we estimate reliable paleo-elevations of the major orographic provinces; (2) How are changes in orography linked with climate variations; (3) Can we quantify continental weathering to better determine its effect on ocean chemistry and atmospheric CO_2 levels; and (4) How can we separate the effects of climate change and tectonic activity on erosion rates?

Ocean Gateways The opening and closing of major ocean gateways has been a topic of discussion for over twenty years but over the last ten years has been stimulated by observational and modeling studies linking some of these changes with major events in climate and the ocean circulation. For example, closure of the Central American isthmus appears to have contributed significantly to increased salinity in the North Atlantic, which is a necessary precondition for North Atlantic Deep Water (NADW) formation. The depth of the Greenland-Scotland Ridge may have regulated the passage of salty subtropical water into regions of active deep water formation. Development of an active North Atlantic overturning cell may also have had a major effect on distribution of sediments in the world ocean; for example the calcium carbonate compensation depth is at least 1 km deeper in the North Atlantic than in the Pacific because of the effects of an active NADW production on deep-ocean chemistry. Opening of the Drake Passage and separation of the Tasman Rise from Antarctica should have affected the strength of the Antarctic Circumpolar Current, heat transport between southern mid-latitudes and high latitudes, and onset of glaciation on Antarctica. Closure of the Indonesian straits and northward movement of New Guinea could have affected development of the Western Pacific Warm Pool and the El Nino/Southern Oscillation system. The history of the Bering Passage and its influence on northern hemisphere climate is almost unknown. Opening of the North-South Atlantic connection should have affected heat transport between the two basins and sediment sequences in the basins (e.g., the "red-green-black" cycles). Despite the recognition that changes have occurred in these gateways, in some cases the timing of changes has not been precisely determined (e.g., Drake Passage) and the impact on the ocean and climate records require considerably more investigation.

Changes in Ocean Plateaus and Ridges A topic that has received less attention but which may be important for changes in ocean chemistry and atmospheric CO_2 levels

involves changes in the volume of ocean ridges and plateaus. Episodic growth of ocean plateaus, such as the Ontong-Java Plateau in the mid-Cretaceous, might lead to increased CO_2 levels because of increased outgassing. Similarly, changes in rates and directions of sea-floor spreading may affect ocean chemistry, atmospheric CO_2, and the paths of bottom currents. For example, a major plate reorganization around 80-85 Ma marks the beginning of a long-term rise in the $^{87}Sr/^{86}Sr$ ratio of seawater and occurs at about the same time as the end of the Cretaceous magnetic quiet period, an ocean anoxic event, and one of the warmest time intervals of the last 100 million years. One goal of future drilling should be to clarify the timing relations between these changes and their effects (if any) on continental tectonics and climate.

D. Recommended Actions

The panel divided its recommendations into pre- and post-2003 drilling. The rationale for this division is that, given the time frame for processing ODP proposals, only a handful of pre-2003 drilling opportunities are feasible. Therefore, only two specific recommendations are made with respect to pre-2003 drilling. With respect to post-2003 drilling the picture is much different and the panel made a number of general recommendations, with some specific elaborations where some concensus developed.

i. Pre-2003 Drilling

With respect to pre-2003 drilling the Panel examined a number of proposals now under evaluation by JOI that meet the general goals of the Tectonic and Climate Panel; the Panel also contacted several researchers about possible new contributions. Based on these activities the Panel recommends two actions on pre-2003 drilling:

(a) drilling of at least one leg in the northern Indian Ocean (Arabian Sea or Bay of Bengal). The uplift history of this region is one of long-standing interest. These legs could also provide information from geochemical proxies directly linking changes in sediment delivery to changes in ocean chemistry.

(b) drilling south of the Greenland-Scotland Ridge to test the hypothesis that changes in uplift of the ridge have modulated the production rate of North Atlantic Deep Water. Observational studies suggest that Late Cenozoic pulsations of NADW appear to be linked to changes in the depth of the Greenland-Scotland Ridge. More precise determination of the timing of NADW and Greenland-Scotland Ridge changes should clarify cause-and-effect relationships responsible for changes in this important water mass.

ii. Post-2003 Drilling

With respect to post-2003 drilling the Panel:

Orography, Erosion, Weathering, and Climate The interaction of the first three of these and their affects on climate require separate studies of the various components. For instance, the paleo-altimetry of Tibet and the Himalaya remains a topic of speculation unconstrained by relevant observations. Similarly, the suggestions of a rapid strengthening of the monsoon at about 8 Ma relies largely on interpretation of the variations in one species of planktonic foraminfera. The suggested cause-and-effect relationship between the increasing height and areal extent of the Tibetan Plateau and strengthening of the monsoon requires considerably more verification before it can be accepted. Ocean drilling holds the key to quantifying both of these processes, one through the products of erosion and the other through changes in the pelagic sediment record. A well-chosen drill site could obtain information of both in one core but because of variations in time and space of these processes we also recommend more widespread drilling in the northern Indian Ocean, both proximal and distal to the Indus and Bengal Fans. Sites close to land could be most directly linked to terrestrial changes but distal sites (e.g., northern 90 E Ridge) could provide more continuous sections and better stratigraphy at the cost of higher resolution. Additional drilling in perhaps the Irrawaddy Delta and South and East China Seas may be needed for better quantification of the total changes in sediment output of this orogenic complex and their relation to evolution of the monsoon, variations in $^{87}Sr/^{86}Sr$, $^{187}Os/^{186}Os$, $\delta^{13}C$, inorganic and organic carbon, and atmospheric CO_2.

With respect to climate-tectonics interactions, interpreting cause and effect from complex terrains can be difficult and ambiguous. There is a need for process studies that examine tectonically simple, spatially limited, actively deforming areas. Examples of areas for such case studies include New Zealand, Taiwan, New Guinea, and Alaska. The reasons to focus on such areas are several: their Late Cenozoic tectonic development is well known, vertical components of rates of slip on faults and rates of erosion have changed by perhaps an order of magnitude during the past 10 million years, major sediment source areas feed directly into the bounding oceans with few intervening sediment traps, and orography affects local climates spatially and perhaps temporally. Changes in sediment flux, sediment composition, provenance, water chemistry, patterns of basin subsidence, and styles of sediment deposition will reflect interactions among climate, erosion, orography, and rates and styles of deformation.

A potentially valuable contrast to intervals of high relief would involve selected legs from times of inferred low relief (e.g., Cretaceous) to determine, for example, whether there are significant differences in the nature and magnitude of weathering – is weathering and erosion linearly related to orography or do other factors, such as possibly higher Cretaceous CO_2 levels, significantly modify the relationship?

Role of Ocean Gateways Several ocean gateways (e.g., Indonesia, Drake Passage, central American isthmus, Arctic, Tethys Sea, North/South America separation) have been identified as important for regulating interocean heat exchange and their effects on climate and patterns of sedimentation. Specific questions involve, for example, dating the opening (and deepening) times of the Drake and Australia-Antarctic passages,

the formation of the Central American isthmus, variations in the extent and depth of the Greenland-Scotland Ridge, extent and depth of the Arctic gateways, and the closure history of the Indonesian straits. Data to determine the depth and flow through the passages would be obtained from sites on either side of the passage or in some cases from more remote regions. These data would include composition of the planktonic and benthonic assemblages, stable isotopes, degree of carbonate dissolution, and sediment types and grain sizes. Because some gateways have been sheltered by island arcs, which may have interfered with the circulation, information from more distal sites may in some cases provide the only means to obtain paleoceanographic data needed for examining the ocean response to gateway changes.

History of Ocean Plateaus and Ridges New or augmented drilling of selected plateaus/rises would be useful in developing case studies of changes in these features. Areas recording information from times of spreading direction changes and ridge jumps, such as the Early Eocene and Late Cretaceous, may provide valuable information about the relation between these changes, tectonic changes on land, and climate. However, more specific information is needed on the precise timing of all of these changes. Because no clear lead candidates were identified with respect to this issue, the Panel deferred from making recommendations as to general locations of sites for future drilling.

E. Priorities

The Panel recommends that highest priorities be given initially to developing: (1) a better understanding of the inter-relation between changing orography and climate change, particularly with respect to the Tibetan/Himalayan complex and smaller, isolated terrains; and (2) drilling legs that advance our understanding of the role of changes in deep water circulation on global climate, in particular the Drake Passage and Indonesian straits. These topics have been chosen because previous research indicates some of the largest uncertainties are in these areas and that the uncertainties could be narrowed by well-conceived drilling legs. However, other targets of opportunity should not be ignored (e.g., the effect of changing volcanism on late Cenozoic climates), and their importance may eventually supersede those suggested here.

F. Implementation

With respect to implementation of the plan the committee considers several modifications from existing ODP policy/drilling:

(1) addition of some coordinated multi-leg drilling to develop a comprehensive assessment of the role of the above processes;

(2) improved coordination between scientists working in the marine realm and continental tectonics and climate modeling. This process can be effected in at least two ways: (a) holding one or more workshops of a general nature where there is sufficient representation from these disciplines to stimulate increased interactions; such workshops might be especially rewarding where there is an opportunity to directly link marine drilling with research on land; (b) including researchers with continental tectonics background as part of the drilling/research team in future drilling;

(3) advances in drilling technology to ensure more complete retrieval of sediments from fan deposits.

Panel Membership:

Thomas Crowley (Chair)	USA/Texas A&M Univ.
Douglas Burbank	USA/Pennsylvania State Univ.
Charlotte Keen	PacRim/Canada/Bedford Inst. of Oceanography
Christian France-Lanord	France/CNRS-Nancy
Robert McCaffrey	USA/Rensslaer Polytechnic Institute
Peter Molnar	USA/Massachusetts Institute of Technology
Dietmar Mueller	PacRim/Australia/Univ. of Sydney
David Rea	USA/Univ. of Michigan
Harutaka Sakai	Japan/Kyushu Univ.

Volkhard Spiess	Germany/Univ. of Bremen
Ralf Tiedemann	Germany/GEOMAR
Helmut Weissert	ESF/ETH Zurich
James Wright	USA/Rutgers Univ.

END OF REPORT